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A Chicago Contract Motor Delivery Service

A. L. Fell's Business a Notable Example of the Possibilities in This Comparatively New But Rapidly Growing Field of Activity

By GEORGE BROWN

THE movement toward co-operative hauling or teaming with commercial motor cars is beginning to show progress in Chicago. The motor truck first came into prominence from its use by the large industrial plants. Now a greater advance is evident since motor truck transfer companies are successfully and profitably handling, wholly or in part, the merchandise delivery for great wholesale businesses, department stores and other retail lines where sales and deliveries necessitate the elimination of delay and where a schedule is followed that demands delivery efficiency.

There are two classes of commercial motor car operators. First those who handle their fleets in a businesslike manner, their accounting system covering everything. They know their profits. They avoid losses. The manager plans his campaign for dividends for each fleet unit. Drivers are taught to handle their machines carefully. A truck's rated capacity is accepted by both owner and driver for its load. Overloading is strictly forbidden. An emergency machine shop with skilled labor is part of the garage equipment and regular inspections are made to see that everything is working properly. This class, daily, on the streets demonstrate motor truck efficiency, but they have been loath to give out figures as to their cost of operation. This secrecy as to the economical advantages of motor haulage has seriously retarded its deserved adoption and with the critical railroad freight conditions now existing the country's second city finds itself in a dilemma, more particularly for transporting food and fuel. If sufficient motor vehicles were available for short or fifty-mile radius hauls, a potent transportation factor for a partial relief of the high cost of living would now be in operation.

The second class are those who buy a motor truck because it is one. They abandon horse equipment for power probably because the initial cost seems more attractive. Body capacity meets their ideas, consequently they care not whether the load is brick or feathers. Abundance of power is their undoing. Through misuse and mismanagement their expense mounts up and they conclude motor trucking is a failure. They seek the second hand truck dealer to unload and recover the part of their investment he offers, and generally accept somewhere near his valuation. Then the second-hand dealer reaps a harvest by overhauling his purchase at a comparatively small cost and disposing of his bargain in Chicago's active used-truck market at a very good profit.

Returning to profitable power haulage, the story of A. L. Fell, one of Chicago's most extensive motor truck delivery contractors, is a splendid example of efficient commercial car operation. Mr. Fell began business operating motor trucks for the John V. Farwell Co. about five years ago with a fleet of ten Autocar motor trucks, with which he conducted all of its motor haulage. Last January he traded-in nine of them as part payment for nine new Autocar motor trucks. In reply to the query, "Why didn't you trade in the ten?" Mr. Fell said, "Their work was so satisfactory in my transfer service that I decided to keep one of them to see how long

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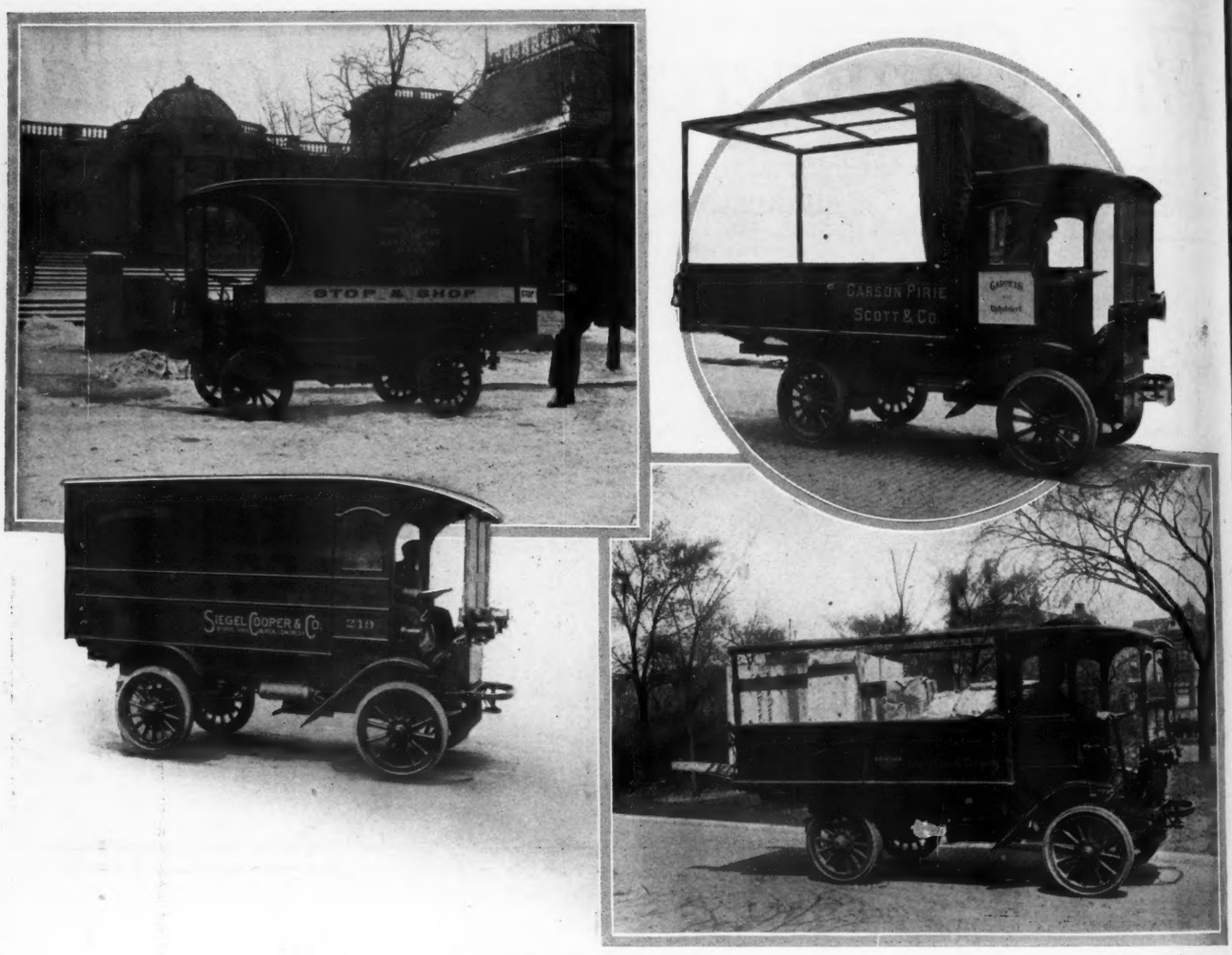


Typical Examples of the Fell Autocar Fleet in the Service of the Different Patrons

it would run. It is, and so were the others, in good condition, but the advantage of running brand new motor trucks for my service must be apparent to you when you know that my contracts for merchandise delivery are with Siegel, Cooper & Co., both wholesale and retail; John V. Farwell Co., wholesale; Carson, Pirie, Scott & Co., wholesale, and recently a contract has been entered into with the Tebbetts & Garland Store, one of the most extensive retail food purveyors in Chicago, to deliver all their sales."

The A. L. Fell motor truck haulage service early in September last began operating from its own garage on Sebor St. at Des Plaines St., Chicago. It is the largest one-story brick garage in the city with a floor area of 187½ by 92 ft., inside measure and without a post or a column. It has a storage capacity for 100 motor trucks, a complete machine shop and all of the many necessary appurtenances for motor truck care.

The Fell commercial motor car fleet consists of twenty-four 1-ton Autocar motor trucks, two 5-ton, one 3½-ton and one 1½-ton Gramm motor trucks. Among the motor equipment also stored, cared and contracted for are thirteen Fords, which are used by salesmen for city service for the John V. Farwell Co.

The Fell motor truck fleet's daily operation extends as far north as Waukegan, south to Gary, Hammond and Chicago Heights, Ind., and west to Aurora, Elgin and the numerous towns and villages within the scope of Chicago's metropolitan free delivery.

MACCAR TRUCK CO., Scranton, Pa., announces that its new factory buildings are nearing completion, and are expected to be ready for occupation by December 1st.

MOTOR TRUCK CLUB OF AMERICA at its last meeting held in the ball room of the Automobile Club of America, 247 W. 54th St., New York City, had as guest of honor, first deputy dock commissioner, R. C. Harrison. Commissioner Harrison, in a short address to the members of the club, spoke of the condition of the pavements along the marginal way, and said that, if the plans of the dock department were carried out, the next year would see a decided improvement in their condition. He spoke also of the ruling against the entrance of gasoline trucks on the piers of New York City. Inasmuch as these piers are of modern, fire-proof construction, these restrictions, he said, should now be removed, as the cause of the ruling was the danger to the piers through fire.

Milwaukee Truck Dealers Plan Association

A new organization is being contemplated by distributors and dealers in commercial vehicles in Milwaukee. It is intended that the new association take as a model, the Milwaukee Automobile Dealers, Inc. This organization is one of the most successful of passenger car dealer associations in the United States. It is intended to have the matter so well under way by January that an exclusive commercial car show can be held in 1918 in the Milwaukee Auditorium.

DUPLEX TRUCK CO. has closed its plant at Charlotte, Mich., and has moved to its new factory at Lansing, Mich. Over 175 men were employed at the Charlotte plant, which is still owned by the Duplex Co. A number of the workmen will follow the company to Lansing.

TOWAR-AYRES CO., Detroit, Mich., has sold its agency for Republic trucks to the Grasser Motor Co., together with its buildings at 472-80 Lafayette Blvd., West. The Towar-Ayres Co. will still be located at 445 Howard St., and will distribute United trailer tractors, Knox tractors and units and Samson trailers.

The Audit Bureau of Circulations means Circulation Facts—not Unverified Claims.

Mustering in the Heavy-Duty War Truck

Two Class B's Built in a Month, Driven to Washington and Presented to Government; Construction Sturdy. Designing Class A Truck

[It is due our readers to state that respect for instructions emanating from a Government censor to withold illustrations and detailed description of the standard military truck prevented our having much of the following matter in our last issue. Release of the material from Washington reached us two days after the publication date of the October number.—Editor.]

THE great big idea that lies behind the building of the Government War Trucks is not alone the fact that these trucks are in reality the best engineering jobs American automobile engineers have ever turned out, but they portray the true Yankee spirit which is ready to meet all emergencies and unlooked-for conditions. Regardless of all the talk about German efficiency, which has been sponsored by the blood and iron rule of German autocracy, the American engineer has really outdone himself in this one instance alone—with the designing and building of the first Government-built motor trucks within thirty days' time. On September 13th the plans for the Class B truck were started and in less than one month two trucks of this model were completed and are now being given a 10,000-mile test. The Government War Truck is a standard proposition in every respect, and is undoubtedly one of the first products that the Government has built for war purposes that is really standardized. Every part in the truck incorporates the ideas of anywhere from thirty to fifty designers. Literally speaking, the whole automobile industry is practically represented in this composite truck design. By standardizing in such a manner, practically any factory that has the facilities can build parts for the Government War Trucks, and this is, no doubt, one of the biggest items in favor of production, when it is considered that by July 1, 1918, 10,000 of these trucks must be completed.

The two trucks which were completed within the month, and are being tested, were Class B's. These were delivered to Brigadier General Chauncey B. Baker, of the Quartermaster Department, by A. W. Copland, Chairman of the Schedule Committee. General Baker, in turn, delivered the trucks to Newton D. Baker, Secretary of War.

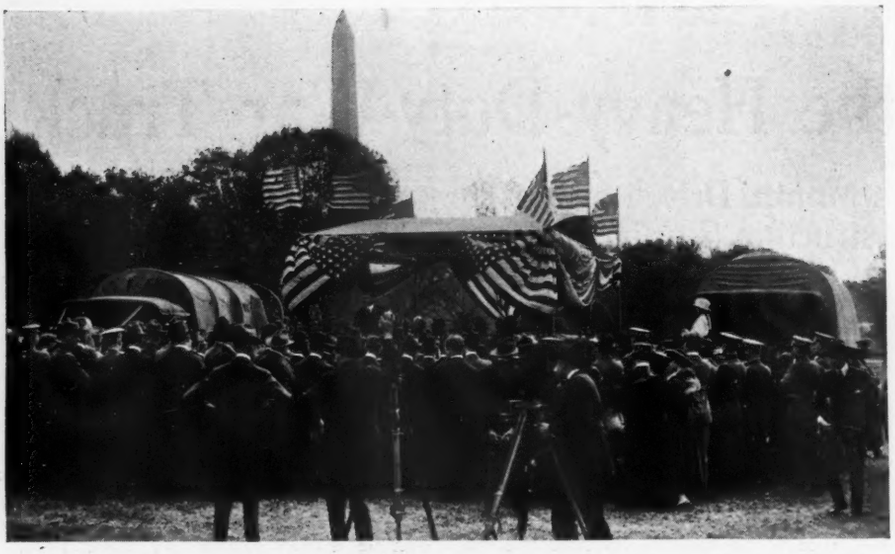
A. W. Copland, discussing the trucks at the presentation ceremonies, said: "Mr. Secretary and gentlemen, and General Chauncey B. Baker, representing the engineers who designed the standardized Class B heavy-duty war truck, under the direction of your officers and the manufacturers who collaborated in building the two sample trucks which we have here, I have the honor to turn over to you these two sample trucks, which are the first fruits of our labors.

"We promised you to design the Class B heavy duty war trucks and build two samples by October 10. These two sample trucks were completed two days ahead of the schedule, one being built in Rochester, N. Y., and the other in Lima, Ohio. For road test they were driven under their own power over the mountains to Washington.

"The engineering work is now finished, and the Class B heavy duty war truck is ready for quantity production."

General Chauncey B. Baker, accepting the trucks from Mr. Copland, expressed gratitude and appreciation to all of the engineers.

One of the First Two Heavy-Duty War Trucks Before the Body Was Put on. This One Was Built by the Gramm-Bernstein Co., Lima, O.



Secretary Baker Receiving for the Government the First Two Standardized War Trucks

"Mr. Copland, members of the Schedule Committee and of the Society of Automotive Engineers, all of whom have done so much in putting into these trucks your energy, your time and the children of your brains, we can only say we thank you. I shall take the privilege of asking the Secretary of War to express to you the gratitude that the Army and the nation will have in knowing the results of your efforts."

To which Secretary of War, Newton D. Baker, replied: "General Baker and Ladies and Gentlemen: There are some very significant things about this moment. We are assembled here to see the fruits, the embodied fruits of the application of American ingenuity and patriotism in the service of a great national cause.

"It is, of course, true of modern war that it is a scientific combat. In the very highest sense of the word all of the advances of modern science are being called into service in order to enable us to attain superiority over our adversaries. In America we have seen many stimulating evidences of the willingness and enthusiasm with which our people are co-operating in our preparation, but I know of none more significant than the two mechanical triumphs which have been worked out in the production of the Liberty motor for the airplane service and the production of the standardized truck for army transport. The enormous economy of this simple machine, with its interchangeability of parts, its facility of dispersed manufacture is so great that I have no doubt that both our own army and those associated with us will regard this as one of America's substantial contributions to the war.

"I want to say to those who have been engaged in this work that while their occupation has seemed somewhat less spectacular, perhaps, than the uniformed military activity of the soldier in the battlefield, it is in no sense a less significant contribution to the advancement of our national cause. Therefore, on behalf of the Government, and notably on behalf of the War Department, I express to all those who have been instrumental in bringing this great thing to pass our very grateful and hearty appreciation and I extend to them also the compliments of the Government upon the speed and certainty with which they have done their task and the fine success which has attended their efforts."

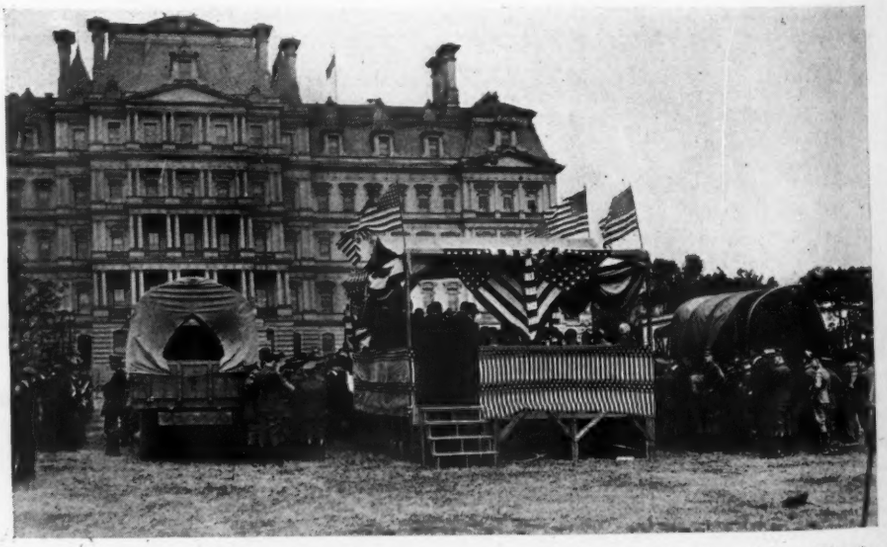
Secretary Baker, following the acceptance of the trucks, drove the truck himself from the grounds behind the State, War and Navy Building out into the street and around the grounds. President Wilson and members of his Cabinet viewed the trucks later in the day when they were driven to the White House Park.

H. L. Horning, chairman of the Automotive Products Section of the War Industries Board, discussed the truck at length with President Wilson, who was particularly interested in the short schedule allowed for the design and production of the first truck and in the remarkable record which even exceeded the scheduled time.

The acceptance of the trucks by the War Department marks one of the greatest engineering successes of the war. Speedy and efficient transportation of supplies to advancing armies is one of the chief factors making for victory in modern warfare and the new truck is undoubtedly destined to revolutionize army truck work in operation and maintenance. It will also play a large part in affecting truck design in commercial circles as the Quartermaster Corps will allow commercial manufacture of these trucks under certain qualifications.

The two trucks that have been assembled have exceeded the expcctations of not only General Chauncey B. Baker of the quartermaster department which has directed the work, but also of the two score of engineers and hundreds of draftsmen who worked on the design in this city. Early tests of the engine showed 58 h.p. at 1350 r.p.m., and the engine torque curve is better than anticipated. It is now assured that the U. S. heavy-duty War Truck is one of the greatest engineering successes of the war, and that it is destined to revolutionize army truck work so far as operation and maintenance are concerned, and that the truck will play a large part in affecting truck design in commercial circles.

That the War Department, as well as the members of the Society of Automotive Engineers who co-operated in the design work, are convinced that the truck is right, is shown by the fact that orders for 10,000 parts for the truck have already been placed, these orders including engines, axles and other parts. These orders have been widely placed over the industry, three or more different companies generally receiving orders for each of the different parts.



View From Behind the Stand During the Ceremony of Receiving the Heavy-Duty Trucks

Any apprehensions as to the truck being too heavy for its carrying-capacity have been dissipated by the statement of weights given by those companies building the units entering into the first machines. The maker who assembled the first truck states that the total weight of the chassis without body is 8500 lb., which with a 1600-lb. body will bring the total up to less than 10,000 lb. A few examples of weights as given by makers that have produced some

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of the parts indicate how well the engineers have worked, notwithstanding they were under orders to build a stout robust job suited to the extreme service of the war zone. The engine weighs 1012 lb. The rear axle weighs 1592 lb., with hubs and brake-drums, the front axle with hubs 352 lb., the transmission 233 lb., the clutch and case 103 lb., the frame without castings 653 lb., the front springs 148 lb., the rear spring 544 lb. With different makers these weights vary from 40 to 50 lb. in such a case as the engine, and there are smaller variations with other parts. Without doubt weights of these parts taken after they are well in production will show many cuts in all of these figures.

Now that the War Truck, as it has been christened, is a reality, the herculean work of the forty or more S. A. E. members who developed the design under the direction of Captain W. M. Britton, stands out in strong relief. The work of speedy co-operation that characterized the production of the Liberty aviation engine has been equalled in the case of the War Truck. In spite of the fact that a greater number of interests were involved in the building of the truck, making compromises in design more difficult, great unanimity of feeling among those participating makes the result the more remarkable, and if anything more unusual than the performance of the relatively few engineers engaged in the case of the Liberty airplane engine. Roughly there were four major divisions of the engineering work, those relating to the engine, the transmission, the axles and the other chassis parts. Each was manned by a corps of engineers. There were three, four and in some cases five different companies represented in the work of one unit, and it was necessary for the engineers to sink all personal pride and contribute the very best known to the art. Each unit represents a composite of the best features contributed, rather than the work of any one individual. The engineer best qualified to design a certain part handled it in consultation with his fellow engineers. Considering the great amount of conference work, it is amazing that the truck has come through so rapidly; in short, it was unbelievable to many a month ago that the task could be accomplished. The impossible has come to pass and a new chapter in war co-operation has been written.

Quick Work by All Concerned

The Continental Motor Manufacturing Co., which was one of the several engine producers participating in the program, received blueprints on September 9, and had an engine running within 19 days and 18 hours thereafter.

The Waukesha Motor Co. made a still better record, getting its first engine running within 11 days 7½ hours from the time the blueprints reached its factory. These companies did not have to make all the patterns for castings or the dies for forgings, some of these having been made previously, but they had to do most of the machining and other operations on the parts. In developing the engine four or five makers co-operated by dividing the different parts between them, one making several parts not only for itself but for the other engine makers. In this way time was saved. The Continental Co. made the cylinders, gear case cover and many small parts such as pumps, bushings, etc. The Waukesha Company manufactured the cylinder heads, the crankcase, intake and exhaust manifolds, roller push-rods, etc. The Wisconsin Co. made the lower part of the crankcase.

The remarkable patriotic response of manufacturers of raw and finished products made possible the completion of the units in record time. As an illustration the Park Drop Forge Co. worked continuously in three shifts and succeeded in sinking the dies for the crankshaft in seven days, an operation which is rarely completed in peace times in less than three weeks. The Werra Aluminum Castings Co. produced the pattern for the main crankcase and the first casting in five days, this usually taking three to four weeks on much smaller jobs. The Continental pattern shop completed the pattern for the cylinder pairs in slightly over five days, an accomplishment which can be appreciated only by those who have manufactured engines.

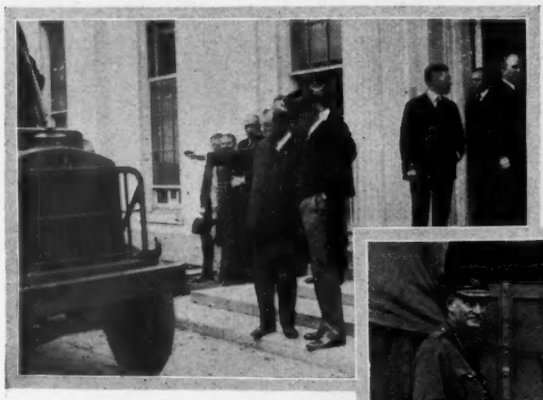
In summarizing the co-operative talent embodied in the engine, it might be said that the crankcase is Continental, the cylinders Waukesha, the oiling system a combination of Wisconsin and Buda, the pistons Hercules and the timing-gear system a combination of Buda, Wisconsin and Continental. The governor is a combination of Kelly-Springfield and Waukesha. The camshaft is a composite design. The engine has been designed with the thought of using the heavier fuels, the combustion chamber and other parts having been designed to meet these requirements.

What has been said of the engine can be said of the transmission, the axles, and other parts. Three or four of the leading axle makers have worked together on the axle designs. So with the transmission.

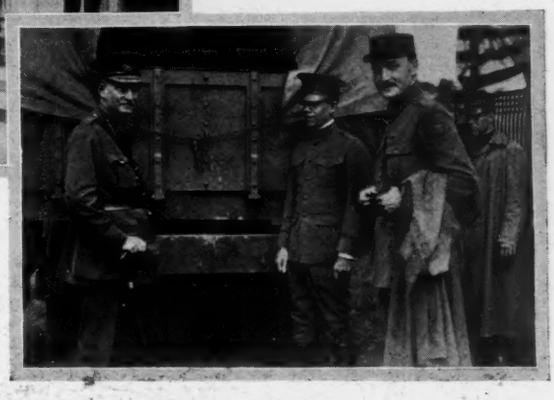
So well have all of the engineers co-operated that the schedule set for the completion of the different truck units, as well as of the completed truck, has been lived up to and generally improved upon. The first engines built in different factories were to have been delivered on September 30 and they were delivered on that date. The completed chassis was to have been ready October 10 and was ready on October 7.

The spirit which has made possible the thousands of standards developed by the Society of Automotive Engineers has arisen to the patriotic impulse and made possible this concrete instance of the development within very little more than a month's time of one of the most effective transportation units ever produced for the conduct of war. When the history of this war shall have been written, will not the outstanding facts be that the failure to take Paris within a month was due to the inability of the German transport system to follow the otherwise perfect organizations in other arms of the service; and that the battle of Verdun was won by the efficiency of American commercial trucks in furnishing this shell-torn stronghold with materials of war and food? And is it not entirely probable that the American forces in the field will be able to drive through to the final victory due entirely to the fact that their transport system had been standardized; and that when the final advance comes the American troops will be able to go forward supported on materials of war by the most efficient transportation system consisting of the motor trucks which have been herein described? And in this final engineering victory there will be no more glorious name in the annals of history than that of the Society of Automotive Engineers, the members of which contributed the Liberty Engine and the War Truck.

The wheelbase is 160 in., the engine 4¾ by 6 in., 424 cu. in. displacement. The transmission is a four-speed amidships, the clutch is a dry-disk enclosed in the bell housing and the rear axle a worm-drive



President Wilson Having the Truck Explained to Him by H. L. Horning, Chairman of the Automobile Products Section of the War Industries Board.



General McLachlan, British Attaché, and Another Foreign Representative Being Shown the Standard Heavy-Duty War Truck by Major W. G. Wall.

being a 16-gal. reserve tank under the seat and ignition is double with battery and magneto system entirely separate. The frame is pressed steel of channel section and straight. The springs are almost perfectly flat and Hotchkiss drive is used. The brakes are internal and on the rear wheels. Taken as a whole there is nothing peculiar in the design except its unusual strength for the load capacity. It is really a 5-ton truck and will probably weigh approximately 8000 lb. for the chassis with wheels and tires but without body.

Probably there has never been a better designed engine. Three particular points kept in mind were the best possible lubrication, provision of a water jacket reaching every smallest point likely to become hot, and rigidity without excessive additional weight. The exterior is noticeably clean. The governor mechanism is entirely enclosed, very simple and its setting cannot be tampered with. The cylinders are cast in pairs with detachable heads, each head being secured by thirteen ½-in. studs. The two spark plugs are located side by side, with a water space between their bosses, right in the center of each cylinder. The brass water-outlet pipe is offset enough to allow easy access to both plugs with a socket wrench. All the combustion space is in the head castings, the tops of the blocks being faced flat, the valve heads standing up a little from this surface. All valves have ports of 2⅛-in. clear diameter and tungsten steel heads and stems, and 60-lb. springs. Each block is attached to the crankcase with seven ¾-in. studs. The crankcase is all aluminum including the bell housing and the oil pan. At the rear end two deep arms act as the rear supports. The front support is a spigot on the front end cover, turned and held in a swivel collar on a dropped cross member of the frame, so giving a three-point support.

Other of the First Two Standard Trucks, Built by the Selden Motor Truck Corporation

Complete pressure lubrication is used even to the extent of feeding the wrist pins through tubes secured to the connecting-rods. Oil is fed to the three main bearings, thence by straight holes diagonally to the crankpins and thence to the wrist pins. The pump is in a well at the extreme rear right end of the crankcase oil pan where it is separated from the rest of the system by a wall that prevents oil falling from the bearings from entering without first passing through the screening system which is very elaborate. The forward position of the pan is very shallow so as to give great clearance over the front axle and sloped toward the deep rear end which contains all the oil. The top of this stump is closed by a sheet of thin steel having in the center a funnel reaching nearly to the bottom of the pump. This funnel is surrounded by a wall reaching nearly up to the sheet steel just mentioned, so that oil has to pass down the funnel and then up again over the wall, the chamber into which the funnel discharges being thus always full; this is the settling chamber, designed to catch all particles of carbon and impurities and prevent that from passing on into the main oil reservoir. However, after passing over the wall beyond the funnel there is still a large screen of wire mesh to be passed and another screen is used on the actual pump intake. This makes the oil circulation from pump to bearings to settling chamber to first screen to second screen, and then round again. The settling chamber can be cleaned by a plug in the bottom and draining it does not affect the main body of the oil, so very little need be wasted. The tappets are housed individually in the crankcase, each being a complete assembly of roller, hollow adjustable plug and guide. They are held in pairs by dog clasps and studs. Timing is as follows: Exhaust opens 45 deg. early, closes 5 deg. late. Intake opens 12 deg. late, closes 35 deg. late. There are three diameters for the camshaft bearings: 2¼, 2⅛ and 2 in., their lengths being 2¼, 1¾ and 1⅜ respectively. On the rear end of the camshaft there is a skew gear driving the oil pump shaft.

On the right side of the engine are the generator, the carburetor and both manifolds, while on the left are the water pump, magneto and battery ignition distributor, the latter being set on top of the front end case where it can be driven by skew gear off the water pump drive shaft. This makes for ease in linking together the magneto and the timer advance controls and keeps all wiring on the one side of the engine. The governor consists of steel balls held between a disk that can slide forward against a spring and a female cone fixed to the camshaft. The disk bears upon the short end of a vertical lever, the upper end of which is linked to a throttle in the intake manifold just above the carburetor attachment flange. This lever is fully enclosed and the spring which pushes against the centrifugal action of the balls is set in the case halfway up the lever. Here there is a threaded plunger with a lock nut by which the pressure on the spring is set and both pin and lock nut are secured when set by a sealed wire that entirely prevents unauthorized adjustment. The throttle, operated by the governor, is the usual butterfly sort, but is set a little off center so that the suction of the engine tends to open it, thus making for a quick reopening and preventing sluggish action. The water pump is a separate assembly and its shaft is coupled to the drive shaft, which is set in the crankcase and carries the gear. This makes the pump detachable without disturbing the front end. The magneto is set well back on the left side and is coupled to the rear end of the pump shaft.

The crankshaft is a conventional design. The diameter is 2½ in. on the three main bearings and 2⅜ in. on the pin. The bearing lengths are 4 in. for the rear and middle bearings and 3 1-16 in. for the front, the pins being 3 in. long. The webs are very stiff, the long one having a section 3¾ in. wide by 1¾ in. thick, at the thickest point, the 7 deg. draw angle subtracting little from the thickness at the edges. The proportions allow perfectly straight holes to be drilled for the oil direct from each main bearing center to the pin centers. The flywheel is exceptionally large, 20 in. diameter and 4 in. wide on the rim, and weighs 130 lb.

Medium Weight Iron Pistons

The cast iron pistons are fairly heavy, 6⅛ in. long and have three rings and a 1⅜-in. hollow wrist pin locked in position The pin center is 2⅝ in. from the bottom of the piston. Ten thousandths clearance at the top and over the upper ring is called for and four thousandths on the lower ring and the rest of the skirt.

The manifolding system is designed to take care of heavy gasoline and is regarded as the most experimental thing about the engine. The exhaust manifold is conventional except that at the center it has a rectangular opening. The intake

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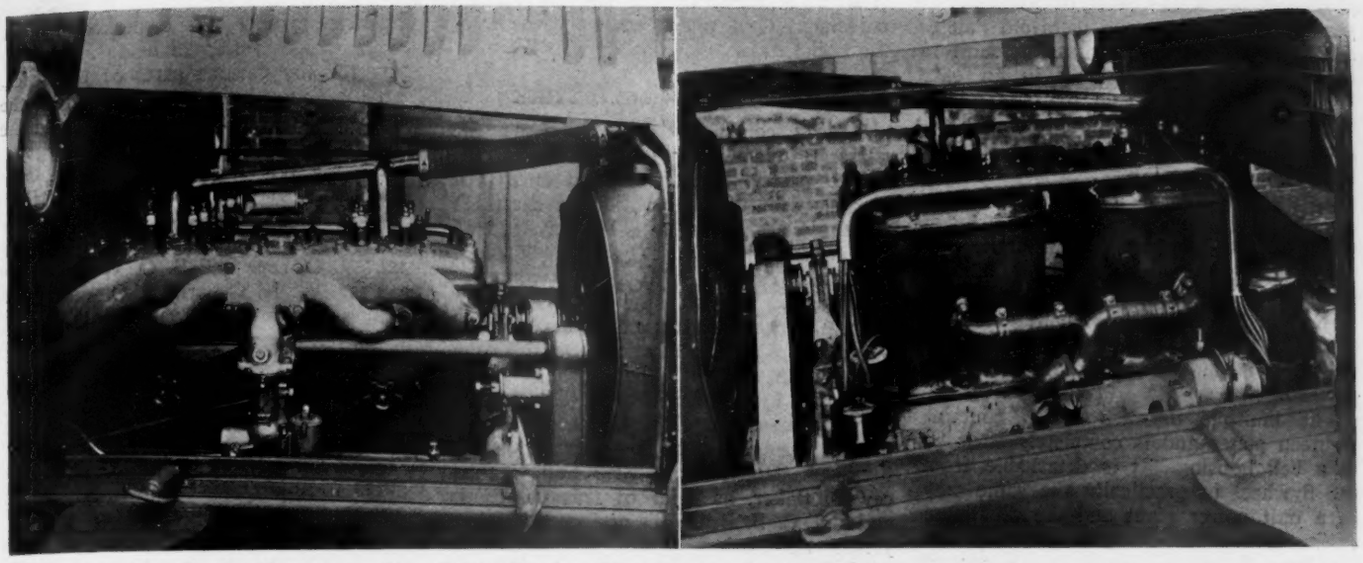
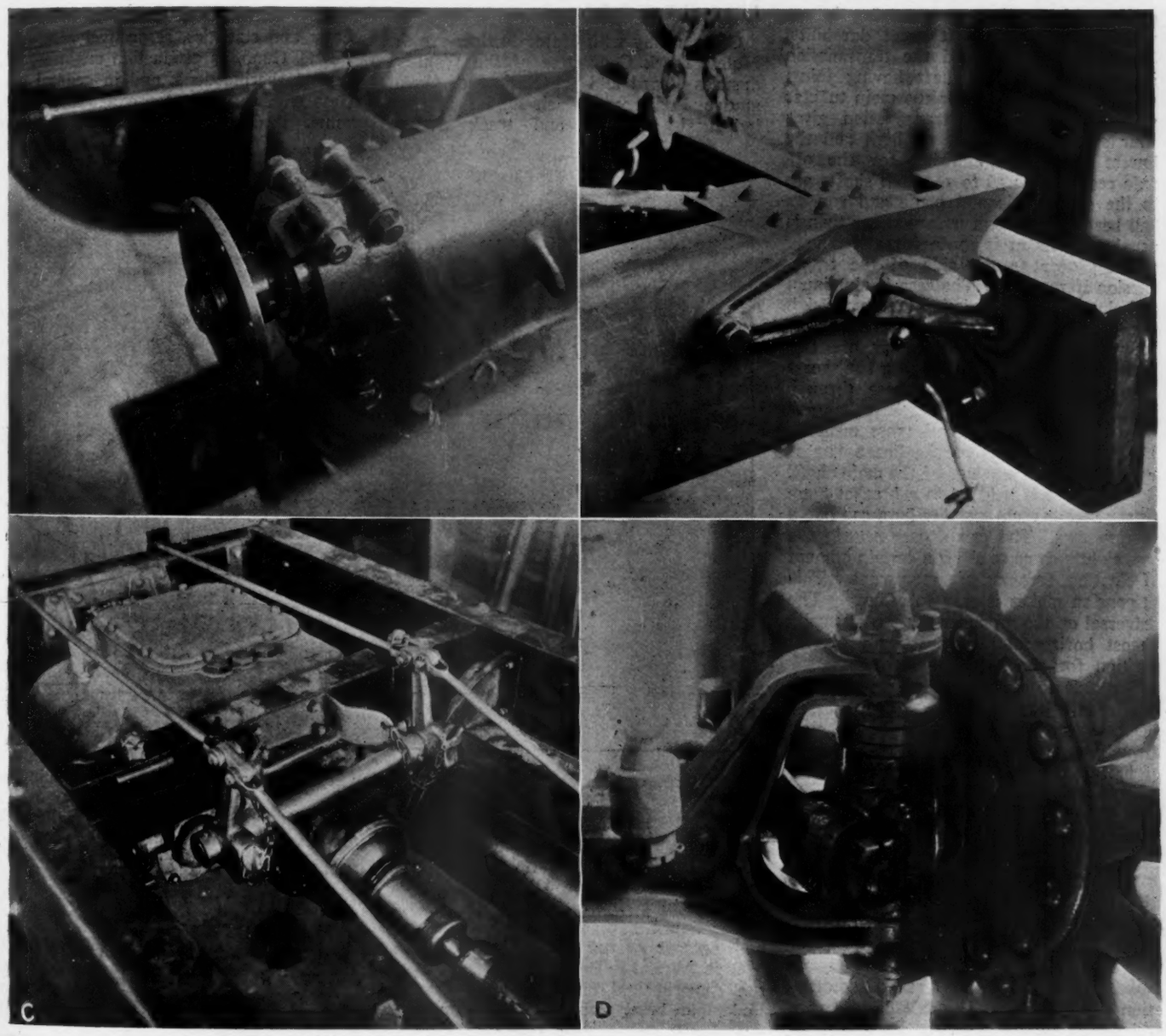


Both Sides of the Engine Used in the Class B War Truck. The Cylinders Are Cast in Pairs, and the Bore is 4¾ Inches, Stroke 6 Inches



Several Features of the Class B War Truck: A—Locking Arrangement of the Worm-Thrust Adjustment; B—One of the Towing Hooks; C—General View Amidships; D—The Sturdy Appearing Steering Knuckle

ports are below the level of the exhaust ports, so that the intake manifold flanges can be attached and the intake manifold branches come out and up in an easy sweep. Where they join there is a rectangular face, matching the one on the exhaust manifold and there is a sort of box like a muff on the intake. These two fixtures bolt together with a gasket, thus allowing the exhaust to play upon the point where the two branches of the intake connect with the short vertical part containing the governor throttle and ending in the carburetor flange. The carburetor is set high and will be a vertical model, though the make is undecided and will be settled by trial.

The multiple dry-disk clutch contains eighteen plates and is completely enclosed in a bell housing. It is detachable from the flywheel in practically the same way as a unit power plant and the aluminum casting also embodies a platform to which the gear lever and hand brake control unit is bolted. The leverage is such that the clutch has a reasonably heavy pedal action and the throw-out bearing is unusually large to give it great durability. Between the clutch and the transmission is a short universal shaft having joints similar to those used for the main tubular propeller shaft. The transmission gives four speeds with direct on high and the lowest gear ratio allowing for the 9½ axle reduction is 56 to 1. Both shafts are in the same horizontal plane and run on ball bearings. The gears are wider than is usual. Provision is made for attaching a winding gear to the side of the transmission if required. The case is aluminum and clutch and transmission together weigh about 300 lb. The transmission is rather ingeniously hung. At the rear are two lugs drilled to receive pins on a transverse axle, and there pins also pass through the ends of a pair of brackets hanging from a plain pressed steel cross member. The front end of the case has a "nose" surrounding the bearings of the main shaft, and this nose is held up to a bracket hung from another cross member by a cap like a bearing cap. The cap does not grip the case tightly so as to allow a certain amount of floating fore-and-aft movement. This suspension makes it easy to remove. The universal on the propeller shaft is normally almost horizontal in a practically perfect position for the Hotchkiss drive.

The axle is mainly Timken in exterior. It is a full floating pattern with a pressed steel case and has taper roller bearings all through, even on the worm shaft. Both sets of brakes are expanding side and side on the same drums. These brakes are of the band type and are provided with adjustment for setting the concentricity of the bands. In laying out the brake connections great care has been taken to plot the path of the brake lever eyes as the spring deflects and the cross shafts, of which there are two, are placed so that axle movement will have a minimum of effect upon the brakes to compensate for torsional deformation of the spring. The axle brake levers are carried up till the eyes are nearly in line with the top plate of the spring, thus resulting in spring deformation, causing an up and down movement of the levers instead of a horizontal one and the vertical movement does not affect the tension of the brake rods.

Planning the Class A Truck

Having completed the design of the Class B Heavy Duty War Truck, the quartermaster department is at once proceeding with the preparation of drawings for the Class A models. The pay-load of this truck is specified as 3000 lb., but it is practically equivalent to a 3-ton commercial truck. As was the case with the Class B truck, this truck is being designed by a complete organization for this one specific purpose, and the work is being conducted by the Engineering Division of the Quartermaster Department. Quartermaster General Henry G. Sharpe is at the head. Under him is Brig. Gen. Chauncey B. Baker, as chief of transportation, and Col. C. B. Brake his assistant. Major James A. Furlow is in direct charge of the motor transport department. These officers have their headquarters at the State, War and Navy Building in Washington.

Co-operating with Major Furlow are the Motor Truck Committee of the War Industries Board and the Society of Automotive Engineers, which advise him on industrial problems and truck designs respectively. Under Major Furlow, in the Engineering Division, is Major Edward Orton, Jr., in direct charge, and this Division has four branches: Experimental and Designing Branch, Production Branch, Production Engineer, and Correspondence and Records Branch.

Capt. Wm. M. Britton is in charge of the Experimental and Designing Branch, under him being technical experts on various chassis units. Also under Capt. Britton is the force of engineers designing the class A war truck. A committee on designs, supervising the phases of this work, are Capt. Britton, B. B. Bachman and A. J. Scaife. Under this committee will be groups whose work will be to submit designs for the various parts of the truck.

In the following paragraph is given the names of the men of these groups and the part of the truck they are designing:

Engines, W. A. Frederick, A. F. Milbrath and J. B. Fisher; axles, A. W. Russel, R. E. Fries and G. W. Carlson; transmission, clutch and control, A. W. Copland, W. C. Lipe and S. O. White; steering gear, W. N. Osborn, S. O. White and D. E. Ross; universal joints, C. W. Spicer and B. H. Urschel; electrical, Lieutenant Matlack and F. C. Kroeger; wheels, R. J. Burrows, Mr. Still and R. H. West.

The experience gained from the designers of the Class B truck is expected to prove of great value to the groups of designers of this smaller truck as they will work in much the same way.

Mr. Girl, director of production of military trucks, has the assistance of Messrs. Quinlan, Morgan, Tracy, Bourquin, Utz and Drefs, who are in charge of raw materials, plants, parts assembly, inspection, charts and statistics, respectively.

E. G. Gunn, as production engineer, will pass on specifications, and in general correlate engineering and production requirements. A chief of specifications, with the necessary index and file clerks, will work under Mr. Gunn, together with draftsmen, checkers, layout men, detailers, etc.

Another View of the Selden-Built Truck, on Way From Factory at Rochester to Washington

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CHAMPION SPARK PLUG Co., Toledo, O., has acquired three new buildings formerly occupied by the Bissell Co. and the City Foundry Co., and a tract of ground covering four acres. The buildings are being remodeled to fit the needs of the Champion company and the output of the company will be increased to 94,000 plugs per day.

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

Rubber Scarce in Central Empires

The only automobile in Germany running on pneumatic tires is Kaiser Wilhelm's. Even the Crown Prince is denied this luxury. Along with Von Hindenburg, Ludendorff, Von Mackensen and the other diadems in the German crown, the Crown Prince bumps along to the front on tires filled with rags, compressed cork and paper. These observations form but a small part of the anthology of facts gathered by Victor Van der Linde, special technical representative of The B. F. Goodrich Rubber Co., of Akron, who just returned from Europe after long study of tire conditions abroad. In some countries tires are not to be had at all, except at a fabulous price and only after a dozen or two high government officials have had one on the witness stand for weeks, literally speaking; gasoline is worth more than champagne and is obtainable only with government consent, and nine-tenths of the automobiles are not running.

Rubber Substitute Unsuccessful

"German scientists have tried to improvise for the scarcity of rubber by compounding what they call synthetic rubber," said Mr. Van der Linde, "but in this they have been unsuccessful. There is not an ounce of crude rubber in it at all and therefore it is devoid of fiber. Then again it has cost about fifteen times more a pound than the vegetable.

"The situation of both Germany and Austria, as concerns tires, is truly deplorable. Countries bounding the Central Empires, with the exception of those that are at war with them, are in just as bad plight.

"Really, the only car running with inner tubes in Germany today is that of the Kaiser. Most casings are stuffed with compressed champagne corks, paper, rags and sausages made of ground cork.

"Some have even been filled with sand and dirt. This only refers to those cars that have ragged casings left. Most automobiles have ground away their shoes and move about on rims bound with rope.

"There isn't a bicycle tire left in Germany, outside of those on military bicycles. Raids by the wholesale were conducted on shops and residences and all bicycle tires seized. These have been reduced to permit their remaking as automobile tires. In fact, everything in rubber has been reclaimed for tire construction and submarine battery cells.

"The cargo of the Deutschland on its last trip was almost exclusively rubber, but so pressing was the demand for the use of the rubber in dirigibles that none of it, with the possible exception of enough for the building of tires for the royal family, was allowed to go into tires.

"Germany had little crude rubber in stock at the outbreak of the war. Since then she has been depending on what she could smuggle through the mails and what she could buy from Sweden. Single sheets of rubber were sent in letters from the United States until Great Britain opened these and confiscated the contents. After this channel had been closed she purchased large numbers of automobiles in this country and had them shipped to Sweden. There she stripped the automobiles of the tires and abandoned brand new machines to the Swedes. But now Great Britain permits no cars to Sweden with tire equipment."

Mr. Van der Linde gave the prevailing price of tires in the following countries: Germany, None to be had; Austria, None to be had; Sweden, $550 for a tire if you have a permit from Royal Automobile Club; Norway, $460 with permit; Denmark, $320 for a tire if you can find one and give written assurance to government that it will not go to Germany; Holland, $350 for a tire with government guarantee; Russia, $100 for one tire; Great Britain, $90 for one tire; France, $90 for one tire; Italy, $100 for one tire; Spain, $125 for one tire.

"In Sweden," continued Mr. Van der Linde, "there are 10,000 automobiles. There are 1,000 in operation and on tires from which has disappeared all semblance of the original casing. Tires hold twenty and thirty patches. Sweden has been placed in this predicament because of the number of tires that have gone to Germany from its ports. England has denied it rubber supplies. Tires are scarcer there now than diamonds.

"Gasoline," Mr. Van der Linde said, "is as big a problem as tires. In no country can you get it without government permit, and in Germany the prices are practically prohibitive. A pleasure trip of two hundred miles would cost the average German $200 in gasoline alone."

This is the European scale of prices on "gas:"

Germany, $6.00 a gallon; Austria, $6.00 a gallon; Great Britain, 95 cents a gallon; France, $1.25 a gallon; Sweden, $1.75 a gallon; Holland, $1.50 a gallon; Denmark, $1.35 a gallon; Italy, $1.00 a gallon; Spain, $1.10 a gallon; Greece, $1.60 a gallon.

Mr. Van der Linde said that Spain had taken advantage of its neutrality to build up a big automobile industry and has built truck haulage systems equal to our railroads. Shortage of railroad equipment forced Spain to adopt the truck as the chief means of travel.

Bureau of Mines Bulletin

Gasoline Extraction.—The Bureau of Mines of the Department of The Interior has issued Bulletin No. 120 on the extraction of gasoline from natural gas by absorption methods, by G. A. Burrell, P. M. Biddison and G. G. Oberfell. This pamphlet contains 71 pages, two plates and 71 figures. A copy may be had, free of charge, upon application to the Director of the Bureau of Mines, Washington, D. C., ordering by number and title.

KARO KARBURETOR Co. has been formed at Chicago, Ill., to take the entire output of the Western Carburetor Co., of Alma, Mich., expecting to handle 200 carburetors per day. The new company is capitalized at $50,000.

New Wheel Shop of the Clark Equipment Company, at Buchanan, Mich.

The Clark Equipment Company, Buchanan, Mich., a large manufacturer of steel wheels and internal-drive axles, has recently changed the name of its products. The steel wheel was known by the trade-mark title "Besco," and the axle by the name of "Celfor." Hereafter both of these products will be marketed under the trade name of "Clark." The Clark Equipment Company announces that its axle production has been increased materially within the last six months, and with the new plants now in operation over a thousand axles are being produced per month. This production schedule includes the complete line, which consists of seven models, from one-half to five tons. In the new wheel shop, which has just been completed, this company is operating one of the largest batteries of the latest type of Bullard vertical turret lathes in the country. The shop is running day and night, producing large quantities of wheels for Nash Motors Company, Packard Motor Car Company, United Motors Company, Winther Motor Truck Company, and many others.

Opportunity comes to the well-informed. Read the CCJ

Boston Mail Service Motorized

By SAMUEL SAYWARD

ALL of the mail service in Boston and its outlying suburban sub-stations is now carried in motor cars. The carrying of the mails in this manner went into effect with the expiration of a variety of contracts with street railways, truckmen, taxi service companies and others.

At midnight, on the first day of the month, the new contracts became effective, and a minute later the first of the big fleet of 85 trucks started on its way from the new government-owned garage in South Boston for the first trip.

The trucks are of three types, Packards with a capacity of one and a half tons, which are the largest used and haul the mail from station to station; White trucks of three-quarter ton capacity; and Ford truck each with a capacity of three-eighth ton. The White trucks will be used in carrying the mails to and from the sub-stations excepting in the case of the largest sub-stations, and the Ford trucks will be used in collection of mail and in parcel post work at the sub-stations.

For operating the new fleet of trucks, 56 chauffeurs were sworn into Uncle Sam's mail service and 100 carriers were instructed in operating the smaller trucks and secured operators' licenses. In addition 12 garage men were also sworn in, to take care of the machines. On the day prior to the actual operation of the motor system each operator or chauffeur was sent over his route with the truck to become familiar with the territory and with the operation of the truck.

In order to obtain the greatest wear from the fleet, each truck does a week's service daytimes and then three night service shifts, this being calculated to give a maximum service from the electric lighting equipment.

The motor truck fleet was adopted for the postal system at the earnest request of Postmaster William F. Murray, who personally went to Washington to urge its necessity as a measure of economy and efficiency upon the post office department. The trucks are equipped with wire cage bodies, of the same style as was used on the former horse-drawn vehicles. The new arrangement standardizes the collection and delivery of mail throughout the entire Boston Postal district, which not only covers Boston but nearly all of the suburbs within a radius of 10 to 12 miles and serves a population of nearly three million people.

The trucks do the work formerly done by 50 horse-drawn vehicles, 15 automobiles leased by a mailing company, a dozen street railway cars and nearly 50 small motor and horse-drawn vehicles hired under contract from private owners or companies. Moreover the trucks have made possible more frequent deliveries of mail to the suburbs, have given additional collections from sub-stations and have permitted mail to be handled under conditions far more sanitary than before.

The government-owned garage is located at Old Colony Ave. and C Street, South Boston. It is built of reinforced concrete and steel with burglar-proof windows and doors. It has a frontage of 200 feet on Old Colony avenue and 250 feet on C street and has numerous skylights, so that the maximum of light and floor space is given and provision is made for housing many more trucks than are at present in service. P. J. Mulcahy has been placed in charge of the motor delivery system and Manager Little of the Boston Mailing Co. has been appointed chief dispatcher.

Before starting out on their first trips, operators of the cars were warned that they would be required to obey traffic regulations existing over their respective routes.

Pennsylvania Registration Shows Increase to Date

That there has been a great increase in the number of motor vehicles registered in the state of Pennsylvania during the nine months from January 1, 1917, to September 30, over those registered during the same period in any other year is shown by the report of the State Highway Commissioner J. Denny O'Neil. His statement shows that there is one motor vehicle for every twenty-seven inhabitants of the state and seven motor vehicles for every two miles of public roads.

From January 1, 1917, to September 30, the receipts from motor licenses amounted to $3,204,606, an increase of $935,654, or 41 per cent. over those for the same nine-month period last year. The motor license receipts for the twelve months of 1916 were $2,325,057.50. This figure is 38 per cent. less than those for the first nine months of 1917.

A large amount of this increase is due to the greater number of motor trucks registered. From January 1 to September 30, 1917, the registration of solid-tired motor vehicles weighing from 4000 to 5000 lb. exceeded that of any other class, 3084 being registered during these nine months, while only 1550 were registered during the whole of last year, an increase of nearly 100 per cent. Trucks weighing from 5000 to 10,000 lb. numbered 5163 in 1916, while the latest report shows 8078 registered The report shows an increase of 778 over 1916 in the number of trucks weighing from 10,000 to 15,000 lb., 1582 being registered in 1916, as compared with 2360 in 1917. An increase of 550 is shown in trucks weighing from 15,000 to 24,000 lb., there being 1081 in 1916 and 1631 in 1917.

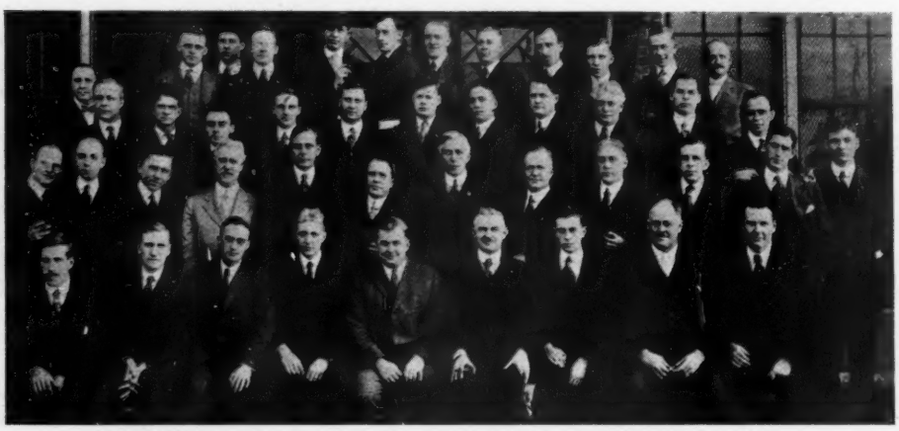
Trucks weighing less than 4000 lb. show an increase of only 121 over the number registered in 1916, 2054 having been registered so far this year, and 1933 last year.

There were 8139 solid-tired motor vehicles registered in Pennsylvania during the year 1915; 11,732 in 1916 and in 1917, up to and including September 30, there are 17,726. This registration shows an increase of more than 51 per cent. over 1916.

Pneumatic-tired motor vehicles show an increase of 36 per cent. over those registered during 1916, and this increase is largely in the number of cars of lower horsepower, the registration of those under 20 hp. increasing 43 per cent.; those from 20 to 34 hp., 36 per cent.; from 35 to 49 hp., only 12 per cent., and those above 50 hp., 25 per cent. The pneumatic-tired motor vehicles registered during 1917 show an increase of 145, 636 more than the number registered in 1916, there being 297,660 in 1917, and only 152,024 in 1916.

In 1916 there were 2701 tractors registered, and during 1917, 2720, a gain of 19.

The report shows a great increase in the number of trailers, 496 having been registered during 1916, and 806 in 1917.



Men Who Attended the Service Conference of the U. S. Light & Heat Corporation

The Niagara Falls factory of the U. S. Light & Heat Corporation contained, from October 23–25, the annual service conference of service-station representatives. Readings and discussions of various phases of battery service-station business, and addresses by a number of the men were included in the program. The annual dinner was given at Niagara Inn, on the evening of the 24th, when speeches were made by the president, Mr. Smith, and other officers and leading men of the corporation.

Commercial Motorbody Corporation

A New Enterprise Formed to Distribute the Product of a Number of Commercial Body Builders

WITH the object of centralizing under one management the distribution of commercial car bodies, the Commercial Motorbody Corp. has been formed with headquarters in New York City. It will not manufacture bodies itself but will handle the output of existing manufacturers who individually are unable to make all of the many styles, as well as dimensions, that the trade requires, and so specialize on certain types of commercial bodies.

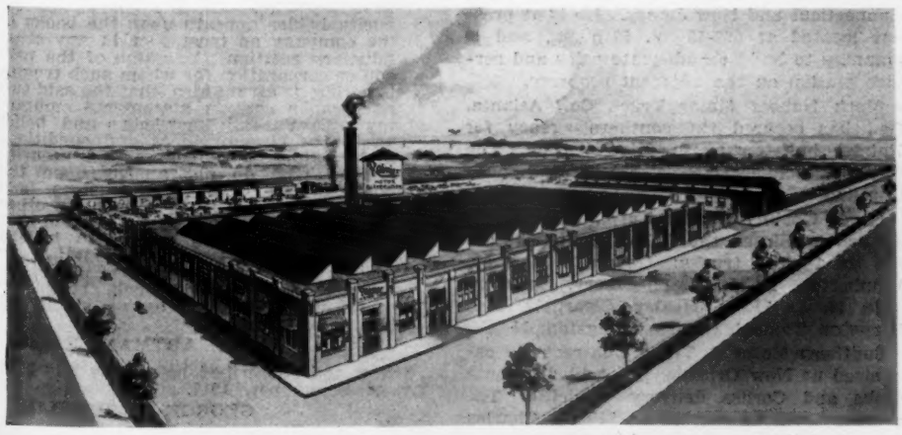
The corporation is issuing a loose-leaf catalogue of the products of the largest manufacturers of commercial car bodies for light and heavy delivery, illustrating over four hundred different types. There are 50,000 automobile distributors and agents in the United States, a large number of whom it is expected will become agents of the Commercial Motorbody Corp. on a commission basis. The corporation having no investment for buildings, machinery and tools, etc., can devote its capital to purchase and sale and will do this business on a cash basis. All commercial bodies purchased by the corporation will be bought and sold f.o.b. at the point of distribution.

Heretofore a purchaser desiring a light delivery motor vehicle has had to select from various catalogues of special designs and has been unable to purchase the delivery car complete from an automobile distributor or agent, causing delay and frequently the loss of a sale of the chassis by the distributor. The new corporation will place distributors in a new position relative to the supplying of commercial cars. They will be able to have their customers select anybody desired from the catalogue and can deliver to each customer through the corporation a complete delivery car lettered and ready for operation mounted on the chassis handled by the distributor, so that the latter can make a sale of a chassis on the spot. In addition a large business is contemplated in motor truck bodies and accessories of all kinds pertaining to commercial cars. The bodies handled will comprise everything from the small "slip-on" body to the heaviest self-dumping steel bodies. A deposit of 35 per cent. will be required by the corporation on all orders and 65 per cent. by bill of lading attached to the shipment.

The corporation is opening three warehouses, one each in Chicago, Detroit and New York, and will show in the catalogue now in the hands of the printers the product of ninety-three manufacturers. The arrangement with the manufacturers is that the bodies will carry the name-plate of the corporation and not that of the manufacturer. The corporation reports to have already on hand applications from 6700 automobile agents for its catalogue. These agents will be allowed a commission of 10 per cent., but the greatest advantage to them will be the ability to make a quick sale of the chassis they handle by being able to supply just the body the customer wants.

There is no other corporation of this character in existence handling the product of a large number of commercial body manufacturers and with the enormous sales force of the distributors, operating on a commission basis, it is felt that a large business is immediately available. The point is made that the corporation is not creating a new business but is only giving to the automobile agents and manufacturers a medium whereby they can obtain any commercial body that they may desire on the shortest notice.

The Commercial Motorbody Corporation's executive office is at 50 E. 42d St., New York City, and its officers are: P. H. Patriarche, president and general manager; C. M. Eaton, vice-president; F. Gates Porter, secretary, and Paul D. Langdon, treasurer. The directors are: P. H. Patriarche, New York City; C. M. Eaton, Raymond Pynchon & Co.; Paul D. Langdon, H. L. Horton & Co.; F. Gates Porter, Raymond Pynchon & Co.; J. K. Robinson, Jr., president of the Ox Fibre Brush Co.; W. A. Harriman, vice-president of the Union Pacific Ry., etc.; T. W. Cole, president of the Cole Paper Co., and F. A. Wagner, of Parker, Davis & Wagner.



Rainier Motor Corporation Factory at Flushing, N. Y., the Home of the Rainier Truck

Rohde Directs Service of Wire Wheel Corporation

The Wire Wheel Corp. of America announces the appointment of O. J. Rohde as its new director of service. Mr. Rohde has been prominently identified with the automobile and allied industries for several years and has been especially well known

O. J. Rohde, Director of Service of the Wire Wheel Corporation of America

through his associations with the Splitdorf Electrical Co., through which company he started in to develop branch house service and jobber and dealer distribution for electrical ignition supplies in a manner never previously attempted. How well he succeeded in bringing ignition service up to its highest point of efficiency was demonstrated by his rapid rise in the Splitdorf Electrical Co., and finally by his selection to create similar service and distributing channels for the Wire Wheel Corp. of America. Mr. Rohde will make his headquarters in New York, where he will put into operation his plans for the service features to go to owners and prospective owners of wire wheels, as well as the widest possible distribution of wire wheels on old as well as new cars throughout the country.

BRISCOE MOTOR CORP., Jackson, Mich., announces that in future the sales of Redden Truck Makers will be handled by the Briscoe company and the general offices of the company have been moved from 1442 Michigan Ave., Chicago, Ill., to the administration building of the Briscoe corporation at Jackson.

LIPPARD-STEWART MOTOR CAR CO., Buffalo, N. Y., announces the appointment of J. J. Martin as representative for the territory from Chicago to the Pacific Coast. Wm. M. White, formerly with the General Vehicle Co., has been made Eastern representative and S. C. Harvey is covering the middle section of the country. John S. Speck is now production manager for the Lippard-Stewart Co.

All phases of the truck industry covered best in the CCJ

Personal Items

E. A. Haskins, formerly manager of the Detroit Motor Truck Co., has become assistant to the chief engineer of the United States Motor Truck Co.

F. E. Carpenter, formerly sales manager for the Stewart Iron Works, has recently been appointed assistant sales manager of the United States Motor Truck Co.

A. M. Armstrong, formerly production manager for the American Locomotive Co., and more recently for the Wright-Martin Aircraft Corp., has been placed in charge of production of the Fulton Motor Truck Co., manufacturers of the one and one-half ton Fulton truck.

Arthur H. D. Altree, vice-president of the Bosch Magneto Co., New York City, has resigned, his resignation to take effect January 15th. Mr. Altree was the first general manager of the Daimler Motor Car Co., of Coventry, England.

Edward E. Gerlinger has been appointed Pacific Coast sales manager by the Selden Truck Sales Co., Rochester, N. Y. His headquarters will be in San Francisco. Mr. Gerlinger's appointment completes a chain of factory division representatives extended over the United States for the purpose of commencing an aggressive campaign for domestic representation. Mr. Gerlinger for a time headed the Gerlinger Motor Car Co., of Portland, Ore., as vice-president and general manager, and has also been instrumental in establishing the Federal Co., on the Pacific Coast.

James W. Florida, formerly assistant manager of the Philadelphia branch of the Locomobile Co. of America, has been commissioned a Major of Infantry, attached to the Motor Transportation Corps. Major Florida has had much to do with the placing of the motor truck in its proper light before the United States War Department.

Herman Loeffler has recently become a member of the sales department of the Duplex Truck Co., Lansing, Mich. He will represent the company in the eastern states. Mr. Loeffler was connected with the Fairbanks-Morse Co. for ten years and for the past three years has been associated with the Novo Engine Co. of Lansing.

George W. Houk, president and founder of the Houk Mfg. Co. and vice-president of the Wire Wheel Corp. of America, died in Los Angeles recently. Mr. Houk began his business career in the bicycle trade and spent fifteen years in London in the bicycle and accessory business. About five years ago he brought the Rudge-Whitworth wire wheel from England and had it manufactured here by the Standard Roller Bearing Co. Later he started making and selling wire wheels of his own manufacture at the plant in Buffalo, which he purchased from the McCue Co.

Clifford M. Snow has succeeded Hal M. Harris as southwestern division sales manager for the Selden Truck Sales Co., Rochester, N. Y. Mr. Snow will be located at Birmingham, Ala., where the division headquarters are now established, having been moved from Atlanta, Ga. Mr. Snow will supervise Selden dealers in Georgia, Florida, Alabama, Louisiana, Mississippi and Tennessee.

J. E. Clifford has been appointed manager of the wholesale department of the H. Barcroft White Corp., distributors of Nash passenger cars and trucks. Mr. Clifford was with the General Motors Co. for a number of years. Before his appointment to his present position he was assistant truck sales manager for the Nash Motors Co.

Herbert J. Flint, general sales manager of the J. C. Wilson Co., Chicago, Ill., and formerly with Thomas J. Hay, Chicago Chandler agent, recently resigned and will announce his new connection shortly.

"Al" Poole, who for a number of years has been associated with the Bosch Magneto Co., has recently joined the factory selling force of the Wire Wheel Corp. of America, successors to the George W. Houk Co.

Paul Minnard has recently joined the sales department of the H. Barcroft White Corp. Mr. Minnard was one of the pioneers in automobile salesmanship, and has, for the past seven years, been connected with the Buick Motor Car Co.

James Alexander, treasurer of the Guaranty Securities Corp., died recently in New York City. Mr. Alexander served the company from the inception of the business in Toledo in the capacity of secretary.

D. Lloyd Smith will become the head of the motor truck research department of the Selden Truck Sales Co., of Rochester, N. Y., with headquarters at Chicago, Ill. Mr. Smith for the past two years has been the sales engineer for the Selden Co.

A. R. Kroh has joined the sales force of the Selden Truck Sales Co., Rochester, N. Y., in the capacity of western division sales manager with headquarters at Chicago, Ill. He will have the supervision of Selden dealers in Illinois, Wisconsin, Minnesota and North and South Dakota.

John H. Hartzell has recently been appointed district sales manager for the Federal Motor Truck Co., Detroit, Mich. He will have the supervision of dealers in the territory south of the Ohio river.

Joseph Bourquin, former production manager of the Liberty Motor Car Co., has joined the government forces at Washington in the truck department.

M. J. Walker, who was formerly connected with the Mack & Saurer Co., has been placed in charge of the truck department of the Floyd J. Logan Co., Spokane, Wash.

New Agencies

Sol Loeb Co., Columbus, Ga., has taken the distributing agency for Superior trucks.

H. Barcroft White Corp. has appointed the La France Garage Co., Elmira, N. Y., distributors of the Nash passenger cars and trucks. H. W. Dean has been appointed distributor for Ithaca, N. Y., and vicinity, and Auburn Motors Co. has been appointed distributor for Auburn, N. Y., territory.

Hermann Motor Truck Co., Inc., has been organized by Eugene P. Hermann for the distribution of Stewart trucks in New York, Connecticut and New Jersey. He is at present located at 607-15 W. 57th St., and is planning to build an adequate sales and service station on the adjacent property.

Mark Nabors Motor Truck Co., Atlanta, Ga., has secured the southern agency for Rainier half-ton worm drive trucks. The territory includes Georgia, Florida and South Carolina.

H. J. Koehler Motors Corp., Newark, N. J., has appointed the following distributors for its 1¼-ton trucks: George J. Cooney, Lumberton, N. J.; J. C. Henry, Somerville, N. J.; H. D. Healey, Clearfield, Pa.; Kingston Taxicab Service, Kingston, N. Y.

Southern Motor & Truck Co., recently organized at New Orleans, La., will distribute Globe and Corliss delivery vehicles. The company will be located at 755 St. Charles Ave. until the completion of its new building at Calliope St. and St. Charles Ave.

Texas Truck & Body Co. has been organized at Dallas, Texas, to distribute Selden motor trucks, Parry bodies and Apperson motor cars. The company is composed of M. Boyd Kieth, president, C. B. Jackson and J. F. Roark.

Stoltz & Wright, Milwaukee, Wis., has taken the distributing agency for Kelly-Springfield motor trucks for Milwaukee and the vicinity.

Model Motor Truck Co. has been organized at New Orleans, La., for the distribution of the Commerce one-ton and the Rush half-ton trucks. C. E. Fettis is president of the new company; W. H. Virgin, secretary and treasurer, and W. J. McLaney, vice-president and sales manager.

Statement of the Ownership, Management, Circulation, Etc.,

Required by the Act of Congress of August 24, 1912

of COMMERCIAL CAR JOURNAL, published monthly at Philadelphia, Pa., for October, 1917.

State of Pennsylvania,
County of Philadelphia, ss.:

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared James Artman, who, having been duly sworn according to law, deposes and says that he is the Editor of the COMMERCIAL CAR JOURNAL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:
   Publisher, CHILTON COMPANY, 49th and Market Streets, Philadelphia, Pa.
   Editor, James Artman, Narberth, Pa.
   Managing Editor, E. S. Foljambe, Drexel Hill, Pa.
   Business Manager, C. A. Musselman, 4203 Pine Street, Philadelphia, Pa.
2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.)
   James Artman, Narberth, Pa.
   George H. Buzby, 4412 Walnut Street, Philadelphia, Pa.
   C. A. Musselman, 4203 Pine Street, Philadelphia, Pa.
3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: None.
4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also, that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and that this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JAMES ARTMAN, Editor.

Sworn and subscribed before me this 20th day of September, 1917.

GEORGE H. SHEVLIN.

(Seal)

(My commission expires April 1, 1921.)
Form 3526-Ed. 1916.

Advertising in the CCJ is memory insurance. "Out of sight, out of mind," you know

THE COMMERCIAL CAR JOURNAL

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The Commercial Car Journal is a member of the Audit Bureau of Circulations

The Law of Self-Preservation Demands the Perfection of the Tractor

WITHIN recent years a great deal of thought, money and time have been given to the building of tractors for farming purposes. Whether or not this expenditure has been intelligently distributed, in view of some of the make-shifts that are now on the market, is a matter of opinion. Be that as it may, the fact remains that there is no piece of machinery on the market today that is deserving of more thought and study than the tractor. The tractor is an economic necessity and is not a thing that will be short-lived or discarded at some future date. On the contrary, it is destined to become one of the greatest business enterprises that the world has ever seen. Although the war may be directly responsible for the tremendous strides lately made by this industry, and the great demand that has arisen for tractors in the past year, the foregoing is only a drop in the bucket as compared with the amount of tractor business that will be done in the future.

Some so-called tractor designers are trying to incorporate ideas in the design of their machines that on their face are contrary to proven mechanical principles. Instead of working toward an ideal, they are building something that will last only for a short time, or for a season, forgetting totally the big future that is lying before them. After the war there will be radical readjustments made in the way of doing business, and war lessons will have taught business men that they will not be able to do business in the old way, but that they will be forced to co-operate in a greater way than ever before. And it is such co-operation that is so vitally needed. It is absolutely necessary that the modern tractor makers co-operate in designing their tractors by using standardized parts and by distributing through the motor dealer or motor machinist. Thus only will the service problems incidental to tractors be eliminated.

Why Not Start Right Now?

Why wait until some future date? Why not get together now and let each manufacturer throw the yoke of individualism aside and work for the best of the industry as a whole? Only by co-ordination can the tractor industry hope to eliminate the waste of time, effort and money that has been the history of every new industry, and through which many companies have failed. The law of self-preservation demands the perfection of the tractor quickly.

Tractor manufacturers must get together now and organize a new body that will not be stifled by old-time methods of doing business, but that will be willing to meet the food demands of the whole world.

Financing Motor Truck Purchases

IS there any reason why banks should not accept paper on commercial cars when they do on manufacturing machinery and farm implements? That is the fact, nevertheless. It is the difficulty in financing truck sales that more than anything else is holding back their increasing. Plenty of people, sold to the idea of motor delivery and justified by every consideration in utilizing it, are held back on account of the difficulty in financing the transaction. Few manufacturers or dealers feel like tying up capital in deferred-payment sales, because it would limit the amount of business they could handle. Were it not for the companies that are springing up in every city, making a business of financing such propositions, there would be fewer sales than there are.

These companies are playing an important part in the development of the truck industry and deserve considerable commendation for the good they have done. There are, however, some among them that are not above criticism. Most of them charge more interest than the purchaser feels like standing and many are trying to take profit in too many directions as by requiring the insurance of the property to be carried with themselves and specifying the equipment of the truck in regard to tires or other parts or accessories usually at added expense and on which they get a commission.

There is an opportunity for a clean business in this line that will be appreciated and will mean much for the truck industry, but, at the same time, there is no reason why the banks should not recognize motor trucks as equally as good collateral as many other things on which they now lend money.

Truck Sales Unaffected by Season

A STRIKING difference between dealing in automobile passenger cars and commercial vehicles, is the fact that the former is subject to fluctuation with the time of the year, whereas the demand for trucks is practically constant regardless of the season. For example, touring cars are mostly bought in the spring and sedan or closed models in the fall. Furthermore, with passenger cars, the practice of getting out new models every year, induces a period just before the new models are due, when buying is flat, because intending purchasers are holding off to see what the new model is to be. Where the new models are brought out the first of the year, there is consequently a slowing up of sales in the fall and winter and it is this more than anything else that is accountable for many makers bringing out their last year's models about six months ahead of time.

With trucks this is not so. There is little change from year to year and, business being carried on without respect to weather, there is about the same demand for their use summer or winter, rain or shine.

Salesmen who are averse to hustling specially during one season of the year and being more or less idle at another period of the year, had better devote their energies to commercial rather than passenger cars.

Metal and Rubber Markets

Distribution of Ferro-Chrome Restricted

The restriction order on ferro-chrome which was recently issued by the Government will affect the automobile industry somewhat. Many makers of passenger cars who are dependent upon a liberal supply of high grade steel will not be able to maintain their present rate of output. Since the price fixing at Washington the steel market has tempered down considerable. Only those manufacturers who have Government orders or who are furnishing material to Government contractors are really busy. The others are handicapped by their inability to get the raw material which is being distributed to those manufacturers who are directly or indirectly working on war material. Quotations on November 5th were:

Steel Products Prices

Bessemer billets, per ton, mill.	$47 50	a	.....
Open hearth, per ton, mill....	47 50	a	.....
Forging billets, per ton, mill..	.....	a	.....
Sheet bars, per ton	51 00	a	.....

SHEETS

The following prices are for 100-bundle lots and over f.o.b. mill; smaller lots are $2 per ton higher. For open hearth stock add $5 per ton:

Blue Annealed Sheets—			
Nos. 3 to 8.....	$5 00	a	5 50
Nos. 9 to 10.....	5 25	a	5 50
Nos. 11 and 12.....	5 50	a	5 75

No. 17 and lighter gauges are based on $5.50 a $7.50 per 100 lb. or No. 28 Bessemer Black sheets.

Box Annealed Sheets, Cold Rolled—			
Nos. 17 to 21	$5 30	a	5 80
Nos. 22 and 24.....	5 35	a	5 85
Nos. 25 and 26.....	5 40	a	5 90
Galvanized Sheets of Black Sheet Gauge—			
Nos. 10 and 11.....	$6 50	a	7 00
Nos. 12 to 14.....	6 60	a	7 10
Nos. 15 and 16.....	6 75	a	7 25
Nos. 17 to 21.....	6 90	a	7 40
Nos. 22 to 24.....	7 05	a	7 55

Above prices are for Bessemer stock. For open hearth stock $2.00 per ton advance is charged.

Tin—Mill Black Plate—			
Nos. 15 and 16.....	$5 80	a	6 30
Nos. 17 to 21.....	5 85	a	6 30
Nos. 22 to 24.....	5 90	a	6 40
Nos. 25 to 27.....	5 95	a	6 45

IRON AND STEEL AT PITTSBURGH

Bessemer iron	$36 30	a	....
Bessemer steel, f.o.b. Pittsb'g	47 50	a	....
Skelp, grooved steel	2 90	a	....
Skelp, sheared steel	3 25	a	....
Ferromanganese (80 per ct.)..	250 00	a	275 00
Steel, melting scrap	23 50	a	24 50
Steel bars	2 90	a	....
Manganese ore, per unit.....	1 00	a	....

Prices of Finished Products

Demand continues heavy for all manufactured metal lines and factories, mills and brass foundries continue active. There is more stability to the market now that the price of copper is more certain, but as yet manufacturers do not quote except on specification. Following prices for brass and bronze products are nominal:

Sheet zinc	$19 00a	....	
Sheet aluminum, 1917 contract..	42 00a	....	
do, outside market contracts..	65 00a	75 00	
do, outside market prompt shp't	75 00a	80 00	
Aluminum wire, outside market prompt shipment	70 00a	75 00	
Copper wire	29 00a	31 00	
Sheet copper, hot rolled	35 00a	37 00	
Sheet copper, cold rolled	36 00a	38 00	
Copper in rods	38 00a	....	
High brass sheet	31 25a	32 25	
High brass wire and light rods..	31 25a	32 25	
High brass heavy rods	28 25a	30 25	
Low brass sheet, wire and rods..	36 75a	....	
Bronze sheet, wire and rods.....	50 25a	50 50	
Brazed brass tubing	44 75a	45 75	
Brazed bronze tubing	48 25a	48 50	
Seamless copper tubing	42 50a	45 50	
Seamless brass tubing	39 00a	43 00	
Seamless bronze tubing	52 00a	....	
Full lead sheets	11 75a	....	
Cut lead sheets	12 00a	....	

ALUMINUM.—The market continues quiet and easy with prices quoted now at 36c to 38c for No. 1 virgin, 98 to 99 per cent., 34c to 36c for pure, 97 to 99 per cent. remelt and 26c to 28c for No. 12 alloy remelt.

TUNGSTEN.—Improvement is noted in the market for tungsten, but the more active demand has not influenced the price, which is unchanged at former quotations. Wolframite is quoted as to quality at $23 to $25 and scheelite at $26 per unit for high grade on the basis of 60 per cent. metal or 30c per unit additional up to 5 per cent.

PRICES OF OLD METALS.—The following prices are current for old metals:

	Cents per pound Buying.	Selling.
Copper—		
Heavy cut & crucible.	21.50a22.00	.... a23.50
Heavy and wire.....	21.00a21.50	.... a23.00
Light and bottoms..	18.00a19.00	21.00a21.50
Heavy mach. comp....	20.00a21.00	22.00a23.00
Brass, heavy	13.50a14.00	14.50a15.00
Brass, light	9.00a10.50	11.50a12.00
Lead, heavy	4.50a 4.75	5.00a 5.25
Tea lead	4.00a	4.25a 4.50
Zinc scrap	5.55a 6.00	6.50a 6.75

The buying prices are those which the larger dealers will pay; the selling prices are market quotations.

Rubber Market Quiet

Absence of buying interests in manufacturing quarters has had a very depressing influence on the rubber market. Quotations on November 5th were:

Para—Up-river, fine, per lb.....	63½a	64	
Up-river, coarse	42 a	43	
Island, fine	50 a	51	
Island, coarse	27¾a	28	
Caucho, ball, upper	39 a	39½	
Caucho, ball, lower	36 a	37	
Cameta	28½a	29	
Ceylon—First latex, pale crepe..	63½a	64	
Brown crepe, thin, clean....	55 a	56	
Smoked, ribbed, sheets	62 a	62½	
Centrals—Corinto	42 a	..	
Esmeralda	40½a	..	
Guayule, Satillo	30 a	31	
Balata, sheets	.. a	80	
Balata, block Ciudad	.. a	70	
Balata, block Panama	52 a	..	
Mexican—Scrap	40½a	..	
Frontera	40½a	..	
African—Massai red	.. a	..	

DOMESTIC SCRAP RUBBER

Prices paid by dealers for scrap rubber were as follows:

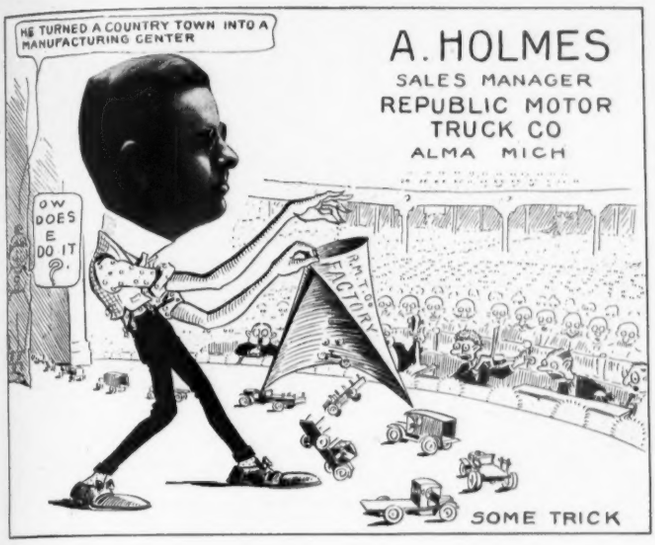
Tires—Automobile	5½a	..
Bicycles, pneumatic	4¾a	4⅞
Inner tubes, No. 1.....	20½a	..
Inner tubes, No. 2.....	10½a	11
Red	10½a	11

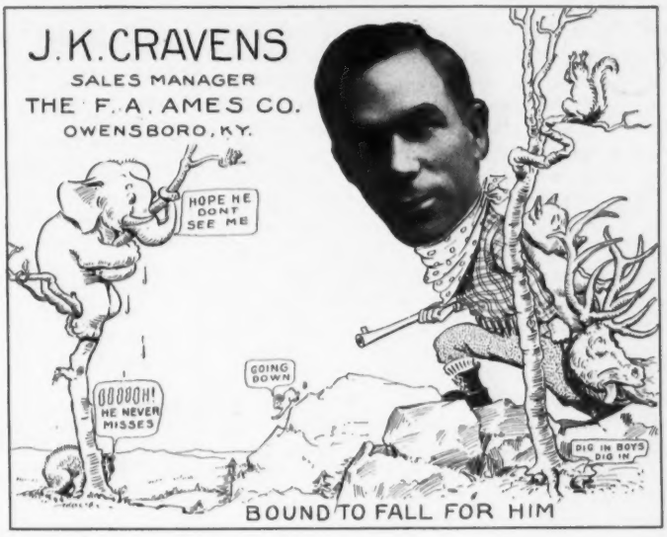
CARDELL TRACTOR CO., formerly of St. Louis, Mo., will remove to Lansing, Mich.

A. T. HARROW TRACTOR CO. will erect a factory at St. Clair, Mich., for the manufacture of tractors. In order to speed up production the first unit will be used for assembly purposes only.

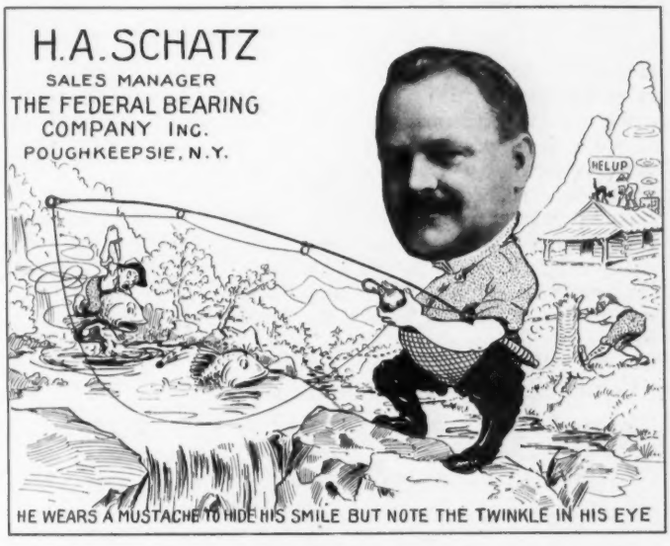
Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

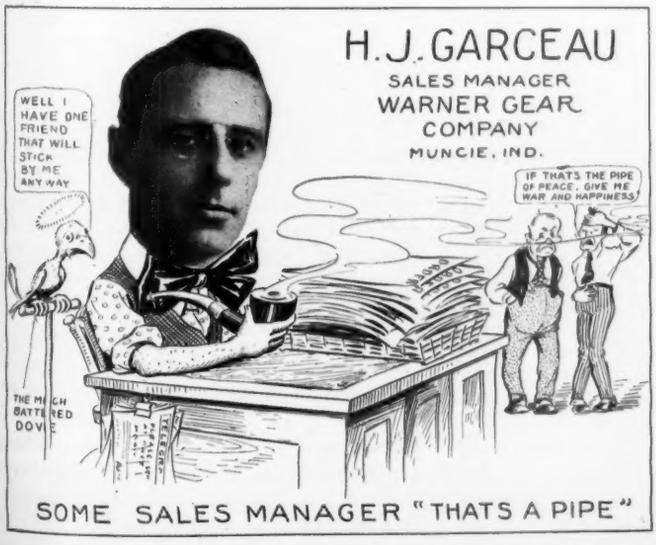
CCJ GALLERY of SALES MANAGERS

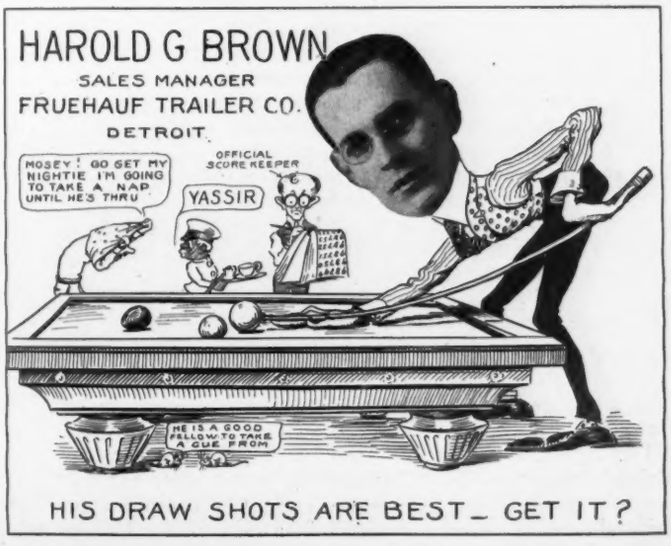




L.E.McGLAUGHLIN
SALES MANAGER
KING TRAILER CO.
ANN ARBOR, MICH.
HEY HAVE A HEART LEAVE A FEW BIG ONES FOR SOME ONE ELSE
BAIT
HE IS A LEADER EVEN IF HIS PRODUCT IS A TRAILER


H.A.SCHATZ
SALES MANAGER
THE FEDERAL BEARING COMPANY INC.
POUGHKEEPSIE, N.Y.
HELUP
HE WEARS A MUSTACHE TO HIDE HIS SMILE BUT NOTE THE TWINKLE IN HIS EYE


H.J.GARCEAU
SALES MANAGER
WARNER GEAR COMPANY
MUNCIE, IND.
WELL I HAVE ONE FRIEND THAT WILL STICK BY ME ANY WAY
IF THAT'S THE PIPE OF PEACE, GIVE ME WAR AND HAPPINESS
THE MUCH BATTERED DOVE
SOME SALES MANAGER "THATS A PIPE"


HAROLD G BROWN
SALES MANAGER
FRUEHAUF TRAILER CO.
DETROIT
MOSEY! GO GET MY NIGHTIE I'M GOING TO TAKE A NAP UNTIL HE'S THRU
OFFICIAL SCORE KEEPER
YASSIR
HE IS A GOOD FELLOW TO TAKE A CUE FROM
HIS DRAW SHOTS ARE BEST— GET IT?

Merit wins—that's why the CCJ is the leader

Motor Truck in Fish-Hauling Service

Wholesale Fish Dealer Replaces Horses for Collecting and Delivering, With a Saving of Twenty-Two Per Cent in Operating Expense

By GEORGE W. GRUPP

CUTTING down the cost of delivering and hauling will cut down the cost of foodstuffs. Slow movement and many handlings increase the cost to the ultimate consumer. And here is where the motor truck comes in. It is swifter and cheaper than horses.

Nearly two years ago F. R. Robbins & Co., Buffalo, N. Y., and Chicago, Ill., gave this question considerable thought. As a result they replaced their horse outfit in Buffalo with a two-ton Republic truck a year ago last May. At the end of the first year, ending May 15, 1917, they found that they had saved $657.895 on their cost of delivery and haulage. But if there is added to the amount saved the rental charge, (they store their truck in the warehouse loading room), and the double life which the tires are giving them, the annual saving would amount to $975.857.

All of the fish handled, which happens to be of almost every kind, comes from Canadian waters. The Buffalo warehouse acts as a distributing point for the eastern and local trade. The truck is used primarily for hauling fish from the freight terminals to the freezers, and warehouse, and from the freezers and warehouse to freight houses. No local deliveries are made unless sufficient orders have been received to warrant a full truck load. They are not in the habit of sending their truck on a five-mile chase with 100 lb. of fish. There must be a truck load of fish, an accumulation of orders, before the truck is ordered to deliver these goods.

Conditions None Too Favorable

This truck hauls an average load of 30 boxes of fish packed in ice, an average weight of 2.5 tons, for an average distance of 3.33 miles round trip. As the freight houses are not very far from the warehouse and freezers, the hauls are rather short.

From the warehouse, freezers and freight houses the truck encounters the roughest kind of stone pavement. There is not a smooth stretch from the Grand Trunk terminal, where most of the fish arrives, to the freezers and warehouse. The road resistance must be at least 75 to 100 lb. to a ton. Moreover, this truck carries an average overload of ½ ton. In spite of all this it is being run for the small sum of $7.67611 a day.

The following cost and performance figures were compiled from the firm's records, for the year ending May 15, 1917.

Operating Charges

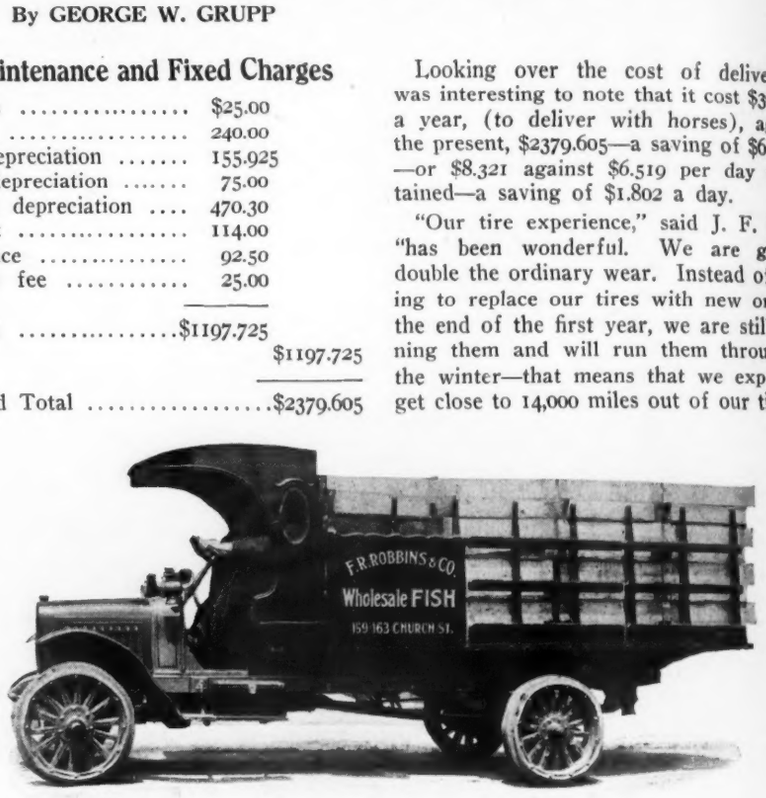
Gasoline	$227.88	
Oil	54.00	
Driver's wages	900.00	
Total	$1181.88	$1181.88

Maintenance and Fixed Charges

Repairs	$25.00	
Rental	240.00	
Tire depreciation	155.925	
Body depreciation	75.00	
Chassis depreciation	470.30	
Interest	114.00	
Insurance	92.50	
License fee	25.00	
Total	$1197.725	
		$1197.725
Grand Total		$2379.605

Looking over the cost of delivery it was interesting to note that it cost $3037.50 a year, (to deliver with horses), against the present, $2379.605—a saving of $657.895—or $8.321 against $6.519 per day maintained—a saving of $1.802 a day.

"Our tire experience," said J. F. Lynn, "has been wonderful. We are getting double the ordinary wear. Instead of having to replace our tires with new ones at the end of the first year, we are still running them and will run them throughout the winter—that means that we expect to get close to 14,000 miles out of our tires.



Truck Handles Increased Business in Less Than Third the Time Required With Horses

Average Costs

Per day operated	7.67611
Per day maintained	6.519
Per mile	.341
Per ton	.455
Per trip	1.137
Per ton-mile	.000065

Investment

Chassis	$1412.90
Tires	162.10
Body and equipment	325.00
Total	$1900.00

Performance Record

Days operated	310
Days idle	55
Days maintained	365
Total mileage	6975
Total trips	2093
Total hours	2790
Total tonnage	5222
Total ton-miles	36,423.450

Performance Averages

Miles per day	22.5
Trips per day	6.75
Miles per hour	2.5
Hours per day	9
Tons per day	16.875
Tons per trip	2.5
Miles per trip	3.33
Ton-miles per day	379.7875
Ton-miles per trip	8.325

"Speaking of the truck," continued Mr. Lynn, "why I don't see how we got along without it. This truck of ours has not only been able to care for our increase in business, but it does it in less than one-third of the time that horses would be able to do the work. We would never be without a truck. Furthermore, we expect to add a few more before very long."

Correction: In the advertisement of the Columbia Motor Truck and Trailer Co., of Pontiac, Mich., which appeared in our October issue, pages 134 and 135, the horsepower rating of the Columbia truck was given as 4. Obviously it should have been 40.

Autocracy finds its strength in its ability to impose organization by force from the top. The essence of democracy consists in the application of the initiative in its own people. If individualism can not be so organized as to defend itself, then democracy is a faith which cannot stand. We are seeking to impose no organization from the top. We are asking the American people to organize from the bottom up, and this is the essence of democracy itself.—*The United States Food Administration.*

The Audit Bureau of Circulations means Circulation Facts—not Unverified Claims.

Organized Freight-Congestion Relief

Philadelphia Chamber of Commerce Promotes Establishment of Co-operative Long-Distance Delivery Service

By K. H. LANSING

PHILADELPHIA is the fist city in the United States to begin mobilizing motor trucks through its Chamber of Commerce into a service to relieve freight congestion brought about by the war. The Chamber's transportation bureau, of which George P. Wilson is commissioner, is co-operating not only for the interests of that organization's immediate members, but also for Philadelphia's shippers generally, with certain reliable concerns engaged in motor truck hauling, to provide instantaneously, without an outlay of capital or organization of force a service equal, and in some cases even superior, to any other means of freight transportation for short hauls.

While a Philadelphia-to-New York service was the prime object and is being worked out first, it is the intention, as plans develop, to include in the points of transportation Boston and other leading New England manufacturing and industrial centers, whose Chambers of Commerce, stirred by Philadelphia's proposition, are helping to study out the shipping problems. It is purely a "gentlemen's agreement," this experimental arrangement originating in the Quaker City, but both shippers and haulers have been so responsive to the service offered and the need therefor is so pressing, that it is conceded to be filled with promise as to its continuance for at least three or four years after the war. Large orders undoubtedly will be coming to Philadelphia and New York after the world conflict is over and it is figured that transportation service auxiliary to railroad, steamship and express company will be not only desirable, but imperative for short hauls of freight in less than carload lots.

Inadequate Railroad Facilities

As early as last January the need for some such supplementary service was realized by the transportation bureau of the Chamber of Commerce. Inquiries from members indicated the approach of a serious situation and investigation showed that freight was piling up because of the inability of the railroads to move it fast enough. A crisis looked near. Then, when the railroads began to move vast war supplies to the exclusion of much industrial traffic, the situation became even more distressing to local shippers. The various embargoes put in operation resulted in turning a flood of inquiries toward the Commerce Chamber's transportation bureau. The supply of cars available for moving manufactures, already woefully short, was curtailed even further. The larger railroads by certain signs and symptoms let it be known that they would welcome shippers taking other means than their cars for moving less than carload lots over short distances.

In June and July conditions became more acute. The express companies were complaining of their inability to handle traffic as fast as shippers desired. Then, on September 17, wearied by continuous explanation in private, the Adams, Wells-Fargo, American and Southern express companies sent out to their patrons a circular signed by their respective vice-presidents, requesting that "freight service and motor trucks be used for the shorter haul traffic in and around the congested districts and that only such shipments for nearby points as actually demand express service be offered to the express companies, so that the traffic requiring expedited service to and from the more distant points may be cared for."

Added to this was a circular from Secretary Redfield, of the Department of Commerce, at Washington, suggesting that shippers use motor trucks, wherever practicable, to relieve freight congestion on the country's transportation lines. Already the Government had let it be known that it contemplated formally taking over coastwise and ocean merchant ships—which has just been done—and, with the alarming scarcity of bottoms, which had caused a rise in freight rates, and the impossibility of building more within the short time required to relieve the situation, the outlook for shippers was indeed dark. With the railroads and the express companies both suggesting the use of the motor trucks, which suggestion coincided with the line of thought already being followed out by the transportation bureau, it looked as if the time was at hand to marshal as quickly as possible a motor truck service as an auxiliary to rail, express and steamship companies.

Commissioner Wilson of the bureau had been studying the problem carefully. He was thoroughly conversant with transportation conditions in their various phases, having come to the Chamber of Commerce from the Pennsylvania Public Service Commission, prior to which time he had been connected for long periods with the tariff expert corps of both the Pennsylvania and the Reading roads. He knew, of course, of the economic value of the motor truck on the short route, when limited to a certain approximate size, weight and load capacity. The need for such a transportation auxiliary was immediate; now was the time to learn how best to put it into operation.

Several established motor truck concerns in Philadelphia already were engaged in inter-city hauling with a measure of success. A few were making daily runs to New York and other points outside the State. It was quickly recognized by the bureau that it would be possible and desirable to utilize existing means for the benefit of shippers, rather than to attempt to organize or "back" a new and untried single concern to move the freight which other transportation means were unable to do.

Typical Large-Platform, High-Stake Motor Truck Used in the "Philadelphia to New York" Service Approved by the Quaker City Chamber of Commerce

Accordingly, after some consultation, it was decided to throw out a "feeler." The transportation bureau sent post cards having detachable return stubs, to a selected list of 500 Philadelphia shippers known to do considerable business with New York City and New Jersey and New England points. This postcard explained what the transportation bureau of the Chamber of Commerce had in mind, namely, the mustering of a motor truck service to relieve freight congestion.

The shippers were asked to advise the bureau through the return postcard stub as to whether they felt the need of such a service and if so, to fill in the probable quantity of freight they would have for shipment daily, semi-weekly and weekly.

The bureau not only heard from a large proportion of the shippers thus addressed, but the quantity of freight which the replies indicated they were eager to have moved by motor truck was far beyond expectations and such as to convince the Chamber that the time for getting in touch with the motor truck haulers had arrived.

The bureau prepared, with a view of obtaining at once as much information as

possible, a circular letter to as many motor truck builders, commercial car fleet owners and men engaged in the business of general hauling by motor truck, known to be responsible, as could be located readily.

This letter asked the recipient to state in brief the facilities of his business, including kinds and capacity of trucks used.

What experience, if any, he might have had in making long-distance hauls.

Whether he would agree, in case of the establishment of a motor truck service, arranged by the Chamber of Commerce, to establish and maintain a reasonably stable and equitable schedule of charges.

Whether he would agree to file a bond sufficient to cover several days' business.

Whether he would allow claims for loss and damage, the plan being to fix $50 for 100 pounds as the guarantee, unless otherwise declared by the shipper, all property valued in excess thereof to be insured, in which case the rate might be increased reasonably.

Whether he would be willing to give receipts for freight to be shipped, showing the measure of his individual responsibility.

So large a number of motor truck concerns responded, showing deep interest in the proposition, that the transportation bureau called a meeting on Friday, October 12, at which time the members and the truck owners went exclusively into the problem of establishing the service, and a tentative working plan was drawn up as the result of this meeting.

While considerable remains to be worked out, the manner in which the plan has been welcomed points to its success and ultimate expansion. The relationship of the Chamber of Commerce to the motor truck service it has thus inaugurated is only that of an instrument to serve the shippers of Philadelphia and, reciprocally, those at outside points who use the service to make return shipments—for that is an important point in the scheme—providing these shippers with a service which it knows to be responsible and reliable; for no motor truck company that does not answer these requirements, file a bond and agree to handle freight properly on an equitable basis will be allowed to enter into the plan.

While no reports will be made on forms by the truck companies to the bureau, it will expect to be kept informed of changes in rates and like information, which it can use for the benefit of members of the Chamber and other shippers; but no specific attempt will be made to regulate the service beyond what already has been indicated. But the bureau will make a point of referring parties desiring freight transportation to such trucking firms as already have their rates equitably adjusted, thus acting as a wholesome check on any concern that might be inclined to stray from the agreement.

Part of the Fleet of Thirty-two Five-Ton White Trucks of the Bean-Fletcher Corporation

Used in the service for shippers, inaugurated by the Chamber of Commerce of Philadelphia. A repair car is always ready to be sent to any unit of the fleet en route

Regarding rate adjustments, of course the bureau will expect the trucking concerns to charge according to the character of the material and its weight. For instance, it would hardly be equitable to charge the same rate for 1000 lb. of feathers, which would occupy considerable load capacity, as for 1000 lb. of machinery, taking up comparatively little space. But the bureau will make no attempt to say what those charges shall be, so long as they are fair to all concerned. It is regarded as essential that the trucking companies work out for themselves all details of the business and hold to their decisions and avoid charging a diversity of rates.

It has been learned by experience that the most desirable plan for making freight charges for motor truck service, is to use 100 lb. as the basis. The lots shipped are usually comparatively small and light in weight for each manufacturer's consignment and as several manufacturers or merchants usually are shipping on the same truck, the most equitable treatment of the problem is to charge for 100 lb.

While it is regarded as likely that rules will be drawn up later for a guide to the general shipping public, at first there will be, as already mentioned, no uniform tariff.

Realizing the enormous loss involved through motor vehicles returning empty from delivering trips, or only partly filled, the bureau will encourage shippers at New York, Boston and other points of destination for Philadelphia goods, to use the trucks for return loads, wherever practicable. The routing plans remain to be worked out to fit the individual cases.

Each Trip a Separate Bargain

Each trip outside the State will be a separate business bargain. As the bureau is considering the development of the service as a permanent one to New England centers, as well as to New York and New Jersey, the proposition may be worked out in these two ways:

(1) By a combination of motor trucks only.

(2) By a combination of motor truck service to New York and by "new business bargain" shipments therefrom, via sound steamers to New England industrial points. In such cases the motor trucking company would act merely as agent for the shipper in seeing that the proper transfer was made to the steamship line.

From present indications the Chamber of Commerce motor truck freight service plan to aid shippers will work out as a five-ton truck proposition. The hauling experts seem to agree that for such purposes as the agreement subserves the five-ton truck having a large platform, with high stakes, is the most profitable. Large trucks for that kind of work have resulted in smaller profits.

The launching of a general service of this kind for shippers with the approval and co-operation of a Chamber of Commerce is new and its development and expansion doubtless will be followed with interest. It will have the effect of encouraging the use of motor trucks of a certain type and will tend to insure the best of service, "speeding" up the companies under the agreement and, if the promise is fulfilled continuously, proving a boon to the buyer and seller in time of need.

Stewart Engine Dimensions

In a caption accompanying an illustration of the two-ton Stewart truck, October, 1917, COMMERCIAL CAR JOURNAL, page 46, it was incorrectly stated that the truck had a 4½ x 5¼ in. engine. The correct dimensions are 4⅛ x 5¼ in.

BURD HIGH COMPRESSION RING CO., Rockford, Ill., has appointed Alan Jamison special representative with headquarters at Baltimore, Md. F. C. Batchelder, formerly with the White Co., Cleveland, O., has been appointed factory representative by the Burd Co.

POLACK TYRE & RUBBER CO., New York City, announces the following changes in the Polack sales organization: James A. Harris, formerly Philadelphia branch manager, has been called to New York to assist the metropolitan sales force; T. J. Manning, who has been identified with the tire business for 15 years, will be in charge of the Philadelphia branch; H. E. Heyder, formerly manager of the Polack Brooklyn branch, has been appointed Western manager of factory sales with headquarters in Detroit.

Advertising appropriations bring greatest returns when expended in the CCJ

Vim Company Announces New Heavy-Duty Trucks

Offering of 1½-Ton and 2½ to 3-Ton Trucks Marks the Entry of This Concern Into the Heavy-Truck Field

THE Vim Motor Truck Co. of Philadelphia, well-known manufacturer of the Vim half-ton delivery car, now announces the completion of two heavy duty trucks to be known as Models 22 and 23, the former a 1½-ton truck and the latter a 2½- to 3-ton truck.

These two new types offered the public following closely the United States Government specifications and conform in most details to the Liberty truck, though changes have been made where it was possible to improve for practical commercial service.

Grace of line reveals rather than conceals the unusual strength that is built into these new types, and they have been subjected to every test that could be conceived in order to prove their ability to "stand up."

The engine used in both models has been especially designed and constructed for truck use and gives smooth and flexible performance. The valves are especially designed and extra long water jackets add to the efficiency of the engine. Cooling system water is circulated by a centrifugal force-pump. All working parts are enclosed to keep out dust and dirt and add to the life of the engine. Other features of the engine are the five bearing crankshaft and gears made of drop-forged, heat-treated, alloy steel. In the larger trucks the transmission, which has four speeds forward, is mounted amidships and the clutch is in unit with the engine.

The frame, axle and brakes are capable of handling over loads, and the springs of alloy steel are of generous dimensions and conform with the Government's specifications.

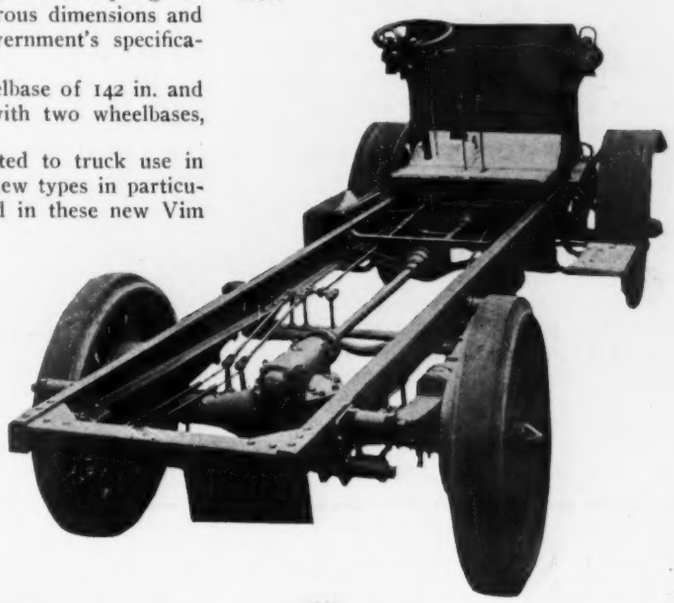
Model 22 has a wheelbase of 142 in. and Model 23 is offered with two wheelbases, 150 and 175 in.

The units best adapted to truck use in general, and to these new types in particular, have been installed in these new Vim models. The price of Model 22 is $2750 and of Model 23, $3550.

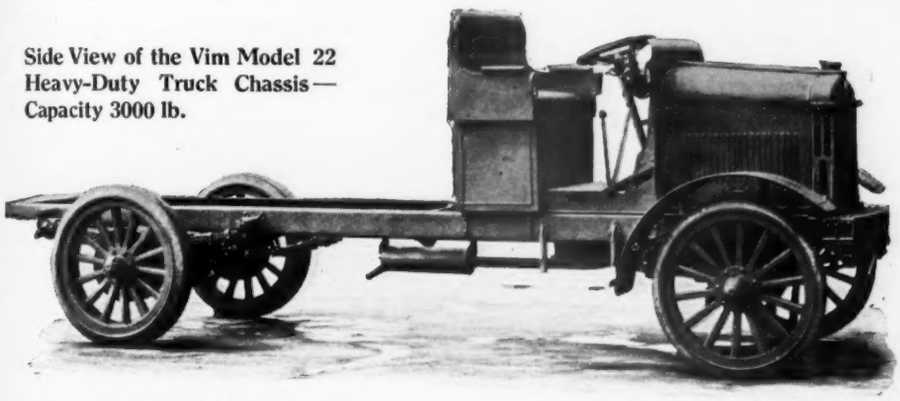
Model 22, which has a capacity of 3000 lb., has an engine rated by the S. A. E. at 22½ hp., actually developing 36. It has four cylinders, cast in block, with a bore and stroke of 3¾ and 5⅛ in. respectively. The crankshaft of this engine operates on five main bearings and lubrication throughout the engine is accomplished by a positive high pressure force feed oiling system. The clutch of the multiple disc dry plate type and the transmission are in unit with the engine. The transmission has four forward speeds and one reverse speed.

A feature of the driveshaft in this model is the use of three universal joints, the shaft thus being divided and supported centrally in the frame. The central mounting is on an annular bearing, which design enables the shafts to be built very short in length, thereby overcoming whipping and excessive wear of the joints.

A Zenith carburetor with water-jacketed manifold is used. Ignition is by the Splitdorf "Dixie" truck type high-tension magneto.



Herewith is Shown the Heavy Channel Frame, the Three-Universal-Joint Drive Shaft, and the General All-Around Sturdy Appearance of the Model 22 Vim Chassis.



Side View of the Vim Model 22 Heavy-Duty Truck Chassis—Capacity 3000 lb.

Front of the New Type Vim Truck, Showing Flexible Radiator Mounting

The rear axle, which is of the semi-floating type, provides worm gear drive. Double internal brakes of 16 in. diameter are used on this model. The front axle is "I"-beam section and is of drop-forged, heat-treated, alloy steel. The wheels are mounted on roller bearings.

Springs are semi-elliptic all around and of alloy steel, United States Government specifications. The rear springs drive through cup centers, double wrapped eyes. Rear springs are 56 x 3 in., front 42 x 2½ in.

The radiator is of the multiple straight fin tube type with cast top and bottom tanks, so supported as to eliminate jars and strains. The frame is of pressed steel, channel type, with a depth of 6 in. and length of 206 in. The steering gear is of the worm and gear type, equipped with 16-in. steering wheel. The driver's seat is on the left, with gear shift and emergency brake levers located in the center.

The front tread is 56 in., rear 58 in. The tires are 36 x 4 in. and the rear 36 x 6 in. The gasoline capacity is 25 gal.

The distance from in back of the seat to the end of the frame is 10 ft. 1 in., and the distance to the top of the frame, unloaded, is 32 in.

The equipment includes oil side and tail lamps, warning signals, a complete set of tools, jack and driver's seat.

Model 23 has a capacity of 6000 lb. The engine of this model, of course, is larger, developing by the S. A. E., rating 28.9 hp.,

but by actual test it develops 46. It has four cylinders, cast in block, bore 4¼ in., stroke 5½ in. As with the Model 22, the carburetor is a Zenith and ignition is by Splitdorf "Dixie" magneto. The clutch in this model is also a multiple disc dry plate type and is in unit with the engine. The transmission has four speeds forward and one reverse and is mounted amidships on the main frame. Four universal joints are employed in the driveshaft, one set between the engine and transmission and the other between the transmission and the rear axle. This design enables the use of short shafts, doing away with whipping and excessive wear.

The "I"-beam section front axle is drop-forged and heat-treated, alloy steel. The rear axle in this model is also of the worm drive type, semi-floating and is equipped with 18-in. diameter double internal brakes. All springs are semi-elliptic and conform with United States Government specifications. The front springs are 42 x 3 in. and the rear springs 58 x 3½ in. The tubular radiator has cast top and bottom tanks and is mounted so as to be protected from jars or shocks.

The frame is of 7-in. channel section, pressed steel, 250 in. over all. The distances from ground to the top of the frame, unloaded, is 34 in. and from the back of the seat to the end of the frame is 10 ft. 3 in., in the case of the 150-in. wheelbase model, and 13 ft. 4 in. in the case of the 175-in. wheelbase model. The driver's position, control lever and the steering gear are the same as with Model 22, except that an 18-in. steering wheel is used. The front tread is 57 in., the rear 60 in. The front tires are 36 x 4 in., dual tires are supplied for the rear, these being 36 x 4 in. The gasoline is 25 gal. Equipment the same as Model 22.

Radiator Service Co., Providence, R. I., has taken over the radiator department of Metallic Shell & Tube Co. of East Providence, R. I. The balance of the business has been acquired by the U. S. Cartridge Co. of Lowell, Mass.

Petitions Government to Encourage Use of Motor Trucks

A petition issued with the sanction of the Patriotic Education Society of Washington, D. C., was presented recently to the Government. Its purpose is to secure the aid of the Government in relieving the congested condition of transportation systems in the United States through a wider and more effective use of motor trucks. The petition, written by Raymond B. Price, read as follows:

"In France, cities are operating motor trucks and serving the entire community. To connect with docks, factories, stores, warehouses and disconnected transportation systems, they have possibilities America has yet hardly dreamed of. In England, the railroads operate motor trucks for freight, something as express companies do here for express. Our railroad men seem prone to view new transportation mechanisms as competitors rather than adopting them boldly to supplement and improve their regular service. Factories in Great Britain are often located in isolated spots to obtain water or other advantages, and lack of railroad spur tracks is compensated for by good roads and steam lorry or motor truck service.

"If less than carload shipments could be eliminated at least partially from our congested city districts and terminals, the railroads would not be demanding so much more money to improve their terminal facilities. And in time their ratio of capital investment of annual income would not be ten to twenty times that of successful manufacturing corporations. By using motor trucks or trackless trolley, and also when conditions permit, water transportation to collect small shipments at convenient stations for through hauls, much of the delay, the inefficient use of equipment and the congestion of expensive inexpansible terminal facilities could be greatly minimized. Some of the keener railroad managers are beginning to see the dawn of a new era, but many are yet living in the past. Express shipments now often take five to eight days between cities only one hundred miles apart. Aeronautical schools are fretting over serious delays involved in shipping aeroplanes from place to place. Private interests hampered by railroad incapacity are starting trucking companies to compete with the railroads. Why should the railroad men be so slow to adopt generally a legitimate cure for one of their own great weaknesses?"

Tractors Popular in Hawaii

[A. P. Taylor, correspondent, Honolulu.]

Tractors of the endless-track type have become an important factor on Hawaiian sugar plantations. The majority of the owners who purchased one or two tractors as experiments have followed quickly with orders for more, and practically every manager who mentions that his plantation is equipped with tractors adds that "more have been ordered."

Pioneer Plantation is an example of the rapidity of motorization of hauling and utility vehicles, as a result of which animals are becoming a minor factor in the development of the estate, which is on the island of Maui, near the town of Lahaina. The manager says the tractors and trucks are savers of time, money and trouble, and there are fewer accidents. With two track-type tractors and four men he is accomplishing the same work that formerly required 40 mules and 20 men, and the work is being done more quickly and safely.

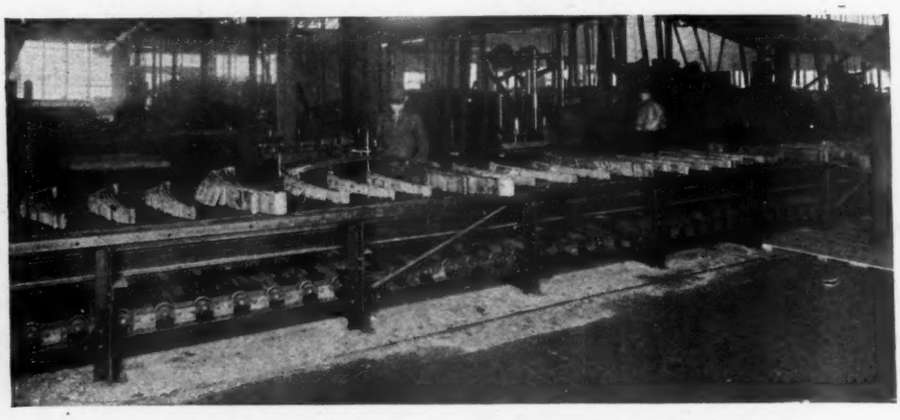
Tasks Performed by Aid of Motor

Wailuku Plantation, island of Maui, has two tractors of this type doing excellent work—a 70-horsepower machine easily accomplishing 30 acres a day with a chain harrow, while a 40-horsepower tractor is being used to haul cane cars over the fields on a portable track to the main-line tracks. Moving bowlders, heretofore too great a task for mules, is easily done with tractors.

It is estimated that there are now 136 tractors of different types on the 45 sugar plantations. In the past 18 months 80 of the track-type have been imported from the American mainland for use on plantations. The most popular size has been the 45 horsepower.

Agents for practically all makes of tractors manufactured on the American mainland are active in Honolulu, while large agencies conduct business for the manufacturers of every make of pleasure automobile. Practically all deals in tractors and autos are made through the local agents.

[An article on tractors in the Hawaiian Islands was published in Commerce Reports for August 7, 1917.]



Movable Assembling Platform Used by the Detroit Steel Products Company

A movable assembly and inspection platform recently placed in the spring factory of the Detroit Steel Products Company has aided materially in speeding up production and in simplifying the assembling of the spring leaves and their inspection before incorporation in the completed springs, while assuring greater efficiency than heretofore. The illustration, herewith, shows a section of the platform, with work being done on several of the successive operations. Twenty-five men work on the platform, who do the work formerly requiring the services of forty-five men. It has a capacity of approximately forty tons of springs a day. One of its main advantages is that it minimizes errors in assembling.

Weber Bros. Do Machine Work

Weber Bros. Metal Works, 108 N. Jefferson Street, Chicago, Ill., is concentrating its efforts on metal spinning and the production of such sheet metal goods and other light metal specialties as the trade requires. Machine work is also done according to what is claimed to be standard quality.

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

New Bethlehem Models

Two types of dump truck, a tractor and a trailer, have been added to the already popular Bethlehem line of hauling units, offered by the Bethlehem Motors Corp., Allentown, Pa.

Model "B-1" with 120-in. wheelbase and power take-off is designed to meet the widest requirements in its field. It will take any known type of dump body and any make of power driven hoist. The Bethlehem designers have taken into consideration the one objectionable point in units of this type, and have built this model with a remarkably short turning radius, for utility in limited space and have given it ability to back against the curb in such a manner that it does not block street traffic, and consequently stays within the tennants of traffic laws on crowded streets. "B-1" Chassis is priced at $1865.

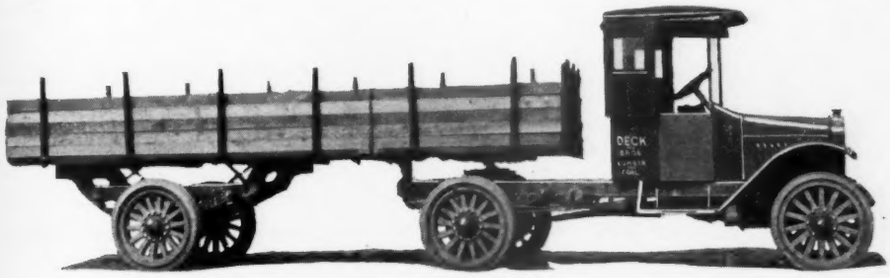
Bethlehem "B-1" is also provided with the standard Woods Hydraulic Hoist with either the short or standard wheelbase, at $2165.

Bethlehem "B-1" tractor model with 120-in. wheelbase, fitted with Bethlehem tractor trailer, has a carrying capacity of five tons. The Bethlehem trailer comes in three lengths: 14, 16 and 18 ft. The fifth wheel used on the Bethlehem tractor is of special Bethlehem design and manufacture. It is built extra strong in each dimension. The trailer is fitted with 6-in. single tires and has the same wheels and rear axle that has stood up so well under the two-and-a-quarter-ton standard Bethlehem truck.

For carrying materials of long length and heavy weight, the new Bethlehem tractor-trailer is well adapted. The tractor, fifth wheel and trailer complete costs $2545.

The Bethlehem line now includes the one-and-a-quarter-ton truck with cab or bow top and express or stake body, the two-and-a-quarter-ton truck with cab or bow top and stake or express body, the two dump truck models, the short wheelbase and power take-off, "B-1" fitted with Woods Hydraulic Hoist, and the tractor trailer.

The chassis colors are Bethlehem green and black, army tan and black, and battleship gray and black.



Tractor-Trailer Model B-1, One of the Latest Bethlehem Products

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EDWARD A. RYAN CO., Mankato, Minn., will distribute Nash motor cars and trucks in Southern Minnesota. The Edward A. Ryan Co. formerly distributed general motor products in South Dakota.

Trailer the Motor Truck's Ally

By HAROLD G. BROWN*

A few years ago, the motor truck was placed before the public, an experiment. Today it has practically outrun the horse team with its heavy wagon and is king of the transportation field.

It will not be long, however, before the motor truck will have to share its throne with the heavy duty trailer and semi-trailer. The truck can not expect to cover the field alone and the trailer and semi-trailer are its logical aides. They have been acknowledged, and some of our largest, most progressive and extensive manufacturers are today using trailers and semi-trailers with their motor trucks to reduce the expense of transporting their products.

Trailers are in use everywhere carrying materials of widely different nature and variety from ice cream, milk, fruits, etc., to heavy steel beams, logs, lumber, castings, etc.

There are many reasons why a truck owner should purchase trailers but it would take too much time to enlarge upon the advantages of this method of delivery. One alone, however, is enough to justify it, the added loading space and greater tonnage capacity.

The semi-trailer and motor truck form an attractive equipment. With the ordinary 2-ton truck, a 6-ton load can be handled with ease. The load is distributed over six wheels instead of four and it is being pulled rather than carried. Twenty-five to thirty-five per cent. of the entire load is carried upon the truck and the balance on the semi-trailer. This distribution is just sufficient to insure perfect traction and proper operation at all times.

This trailer method of delivery is still in its infancy. It is being well nourished, however, and before many months have passed, we will find that it has grown into a man-size, healthy and prosperous assistant to the motor truck.

*Sales Manager, Fruehauf Trailer Co., Detroit.

Jersey Truck Club's Bulletin

The Motor Truck Club of New Jersey has brought out the first issue of a bulletin, that it will publish hereafter monthly, to keep its members better informed regarding the activities of the Club. J. F. Winchester, 22 Washington St., Newark, N. J., secretary of the Club, is editor of the Bulletin.

Its first issue, October, gives the result of the Motor Club's efforts to have the laws that are to go into effect in the State of New Jersey on the first of January, modified to be more fair to commercial vehicle owners. Such concessions as have been made are outlined in a letter from the Commissioner of Motor Vehicles to the Secretary of the Club.

The correspondence interchanged between the Club and the Commissioner, given in full, is a striking evidence of their disposition to co-operate and with harmony between them benefit to all concerned is assured.

HAY BROS. MOTOR CO., Springfield, Ill., has recently been incorporated at $40,000 to manufacture and deal in automobile trucks, tractors and agricultural implements. The incorporators are Mark Hay, Louis M. Hay and Marion L. Hay.

Bird's-Eye View of the Torbensen Axle Company's New Plant at Cleveland, Ohio

Ground for this factory was broken only a little over a year ago. This company holds a prominent place in the manufacturing field, building a large quantity of both rear and front axles. Over five hundred men are employed in this plant, which has a capacity of two hundred rear truck axles per day. V. V. Torbensen is president and chief engineer of the company; W. J. Baxter, vice president; J. O. Eaton, treasurer and general manager; A. H. Ide, secretary; W. F. Rockwell, assistant general manager and factory manager; H. G. Weymouth, general superintendent; T. H. Campion, auditor; R. C. Enos, sales manager; J. R. Phillips, assistant sales and advertising manager; C. I. Ochs, purchasing agent.

Everybody who is anybody in the truck industry reads the CCJ

Advice on Truck Tire Care

By E. C. CURTIS*

The tire expense of a motor truck can be greatly reduced by observing a few simple rules:

It is false economy to continue to use tires when worn down thin, for more damage will result to the truck itself than the few dollars saved in wearing the old tires.

Carefully avoid driving continually in street car tracks, for this will soon cut away the tire's width, leaving the truck without a part of the cushioning effect, or with tires undersized to such an extent that the remaining part of the rubber goes to pieces very fast.

Avoid overloading, as it will cause more unsatisfactory solid tire service than any other cause. All four tires can be ruined at one time by overloading the truck with too great a load. If a piece of rubber is stretched within its elastic limits it will return to its original shape and condition, but if stretched beyond that point it will never come back. The same principle holds for truck tires. Overloading compresses the tire beyond its limit, which breaks it down and ruins its life.

Avoid speeding, for if a tire strikes some obstructions the tire undergoes the same effect as it does when overloaded.

Avoid skidding, for it is likely to tear the tires loose at the base and cause excessive wear of the rubber. Often chains do more harm than good and with ordinary solid tires it is better to play safe and go slow.

When it is necessary for a truck to be driven faster than fifteen miles per hour, we have found our Ideal Cellular tires preferable to solid tires. They are more resilient to overloading, non-heating to overspeeding and non-skidding on slippery pavements, making chains unnecessary.

*Sales manager, Swinehart Tire & Rubber Co., Akron, Ohio.

Lang Body Incorporates

The Lang Body Co., 610 Garfield Bldg., Cleveland, is incorporated under the laws of Ohio for the purpose of manufacturing, buying, selling and otherwise dealing in automobile and aeroplane bodies and automobile parts and accessories of all kinds and doing all things incident or necessary thereto. The authorized capital stock is $500,000. Chas. E. J. Lang, president and treasurer, was one of the founders of The Rauch & Lang Carriage Co., manufacturers of the Rauch and Lang carriages and electric automobiles. Elmer J. Lang, son of Chas. E. J. Lang, is vice-president and general manager. John H. Price is secretary and L. L. Williams, who is factory manager and consulting engineer, has long been associated with The Peerless Motor Car Co. as designer and production expert.

One of the biggest departments that the Lang Body Co. will have will be the truck body department. The company has purchased 5 acres on W. 106th St. and have started to erect the first unit, a three story building and dry kiln over 50,000 square ft.

Chas. E. J. Lang, president and treasurer; Elmer J. Lang, vice-president and general manager; John H. Price, secretary.

Directors—Chas. E. J. Lang, Elmer J. Lang; John H. Price, Price, Alburn, Crum & Alburn, Attys.; Thomas E. Monks, president The Cleveland National Bank; J. P. Loomis, director The Goodyear Tire & Rubber Co., president The Akron Coal Co.; S. W. Whitmore, president The Whitmore Mfg. Co.; E. W. Livensparger, state agent The Baker R. & L. Co.; C. W. Brainerd, vice-president The National Screw & Tack Co.; E. I. Heinsohn, president The Cleveland Welding Co.

Factory Manager and Consulting Engineer—L. L. Williams.

LaCrosse Motor Co., Denver, Colo., has taken the distributing agency for Vim motor trucks for Colorado and Wyoming. H. Mallen and W. McCutcheon are the principal stockholders in the new firm. The agency will be located at 1457 Blake St.

Jones Motor Car Co., Wichita, Kans., has announced that in addition to manufacturing motor cars it will also engage in commercial contract work. This will include the construction of limousine, coupe and all kinds of enclosed bodies and tops, including bodies for commercial vehicles. The Jones Co.'s factory has a floor space of 125,000 square feet and is now equipped for an output of from fifteen to thirty bodies daily.

Activities of the Motor Truck Association of Philadelphia

OFFICERS

O. W. DOOLITTLE, President
H. M. COALE, Vice President
J. D. HOWLEY, Treasurer
W. H. METCALF, Sec'y, 328 N. Broad Street

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LEE J. EASTMAN, E. R. WHITNEY, D. H. ZIMMERMAN, EDW. W. BURNSHAW, JR., W. ROSS WALTON

COMMERCIAL CAR JOURNAL OFFICIAL ORGAN

Liberty Loan Campaign Started. Discuss the War Tax

That the new War Tax bill passed by Congress will affect motor truck dealers was the information given out at the meeting of the Motor Truck Association on October 17th, in the Hotel Adelphia. Mr. A. E. I. Jackson said that the tax of 3 per cent. would be levied on each sale. "In selling retail," he said, "the tax of 3 per cent. will be levied on the customer in each instance. In the selling a truck we draw up what is called a lease contract, if the customer pays a certain lump sum and the rest in instalments and we keep the title as owner of that truck as security for payment, the tax is still effective unless there have been payments on that truck tendered before May 9, 1917. Any payments made before that date do not come under this new tax bill."

Judge Bonniwell made a short speech advocating the Liberty Loan. He cited the instances of brutality on the part of the German soldiers, and said that if affairs were not stopped in time those same scenes would be enacted in our very streets with our own children as victims. He said that if the work done by our boys in France is to be successful they must have the money to back them.

Lee J. Eastman, Chairman of Group No. 3, Liberty Loan Committee, outlined the campaign pursued in obtaining purchasers, and said that a whirlwind campaign would be inaugurated. "October 27th," he said, is the last day for the bond sales. We must all work as hard as we can."

In answer to his call for assistants, twelve men offered to give their time to the cause. Mr. Eastman said a parade would be held next Wednesday in conjunction with the proposed whirlwind campaign, and that several floats would be in it. Six machines were immediately offered for floats. Mr. Eastman suggested that the members of the organization speak to their employes about the Liberty Loan and try to influence them to buy. "Any ban," he said, "will carry the payments along for fifty weeks on the basis of a dollar down and a dollar a week. The men have the money taken out of their wages. If they become sick before the fifty weeks are up and they need the money invested they can go to the bank and draw out every cent they have put in."

Present at the meeting were five members of the British Army, which composes the mission now in Philadelphia securing recruits for the British Army. Col. St. George Loftus Steele told of the work of motor trucks back of the trenches and the tremendous advantages gained by the allied armies in the use of motor trucks.

Lieut. J. W. P. Skidmore, of the First Canadian Battalion, gave a stirring account of the life in the trenches at the Battles of the Somme and Vimy Ridge and showed the different gas masks and equipment used by the Allies. Capt. Allen, of the Eighth Royal Berkshire Regiment, said he had started in the war as an Irishman and he thought at that time he would never be a real Britisher, but he found that the war had eliminated all the foolish little hostilities. He said he had fought beside the Britishers in the trenches and he defied anybody to show him a braver soldier. He also told a number of humorous anecdotes about the Irish and Scotch in the trenches.

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

"Bill" Taylor's Unique Selling Methods

A True Story, Except for the Names, Proving Again That "Honesty is the Best Policy"

By LEN G. SHAW

WHEN "BILL" Taylor sold the United Packing Co. a 3½-ton truck and a 5-ton trailer on the strength of his representation that it would enable the company to cut the cost of hauling tomatoes out of the Luson Valley to the cannery from $1.45 a ton to less than half that amount, the other truck men in Odeon, who had been dealing in generalities in their efforts to sell the United, cursed roundly and charged it up to "'Bill' Taylor's luck."

Robinson, president and general manager of the United Packing Co., had had his patience exhausted more than once by men who made extravagant claims regarding what the trucks they handled would do. When it came to pinning them down to figures—and Robinson was the chief of the "show-me" clan—they invariably failed to qualify, and went away without the order.

The United occupied a peculiar position. It purchased the tomatoes in the fields, assuming the cost of transporting them to the factory. This was done by rail, with the result that there was usually congestion or a famine, shipments in carlots coming in too rapidly to be handled to advantage, or being delayed while the working force idled and the fruit spoiled.

"Of course you'll not haul all your tomatoes with one truck and a trailer—you couldn't do it if you had all the trucks in town—but it will balance up your receipts in a way that will keep you running on an even keel, and it will cost you just about half—perhaps a little less—of what you are paying now," was the argument that influenced Robinson, and induced him to affix his signature to a contract.

"Robinson'll be hollering his head off inside of a week," was the verdict of one of Taylor's competitors, and the rest of the trade concurred in that verdict, for Robinson had the reputation of being a chronic complainer.

The truck went into commission, and Taylor heard nothing further from it, either good or bad.

Ten days later he was ushered into the office of the president of the United and lost no time in getting down to business.

"That truck and trailer I sold you are not working out as they should," he announced.

Robinson made no attempt to conceal his astonishment and looked his visitor over thoughtfully before replying.

"I thought you had come in to sell me another truck," he said. "Instead of that you come in with a complaint about what you have already done. What sort of a system is that?" he asked, laughing.

"What You Want is Not a Larger Truck, But a Smaller Trailer"

"It may not be according to Hoyle as you have had him preached to you," admitted Taylor, "but it is a fact nevertheless."

"Well, how do you make that out? I was checking up on that outfit with our traffic manager only yesterday, and we both agreed that it was making a handsome saving—I don't mind telling you it is doing a little better than you promised."

"That's true enough," agreed Taylor. "It is costing you less than I predicted—now. But it won't the way things are going."

"You mean?"

"Simply this—you are hauling too much at a time."

"But we've never got stuck. The truck is a wonder at pulling—it comes in right along with better than 17,000 pounds to a load, with the trailer, of course."

"And that is where the trouble lies—the drag is too much. There's a stiff grade going up into Luson Canyon and the valley beyond, where you're hauling tomatoes from now. You're all right on that, because you go out light, but when you come out of the canyon and start that climb into town there's nearly a mile that you're pulling up an average 7 per cent. grade. It's too much for a 3½-ton truck to pull a 5-ton trailer up there with a generous overload. It racks the life out of it, no matter how careful the driver, and pretty soon your repair bills will begin to come in, and your saving will materially cut down—and you'll naturally find fault with the truck and the fellow who slipped you one."

"Well, go ahead, what's the answer. A 5-ton truck to match the trailer, I suppose. That would cost the most," broke in Robinson, sarcastically.

"You're wrong," responded Taylor, with a smile, "although your conclusion is perhaps the natural one. What you want is not a larger truck but a smaller trailer—a 3½-ton size—same as the truck."

"But that would cut down our haulage capacity just so much," remonstrated Robinson.

"Not a bit. On the contrary there would be a slight increase in tonnage. As it is, it takes one half as long again to load the trailer as it does the truck, and the same is true when it comes to unloading. Your truck is standing idle that much longer—and it is the expensive end of the outfit. If you're going to make a truck pay as it should it must be busy all the time. As it is, you make four round trips a day—that's 34 tons, not counting any overload, of course. Under the plan I propose you could make five trips in ten hours, or 35 tons which with the proportionate overload would show a slight increase. It means more mileage, but your wear and tear would not be equal to the strain you are now imposing. It is all right the way things are running now, but some day that truck is going to pull its insides out on the canyon grade, and then there'll be something doing."

Robinson surveyed his caller quizzically for a minute.

"And I suppose that what you propose is that, having just put in a 5-ton trailer at your suggestion, we scrap that and buy a 3½-ton," he retorted, sarcastically, "throwing good money after bad."

"You are wrong," said Taylor, ignoring the thrust. "What I propose is taking your trailer back, furnishing you with a 3½-ton trailer, and refunding you the difference in price, which is exactly $360. Is that fair enough?"

"You're just bluffing," was Robinson's reply.

"No, I'm not," said Taylor, earnestly. "I miscalculated conditions, that's all, and I propose doing what is fair to all concerned. I can't afford to let you go ahead under the present arrangement any more than you can afford to do it, for the next thing you'd be knocking my line—and I couldn't blame you very much if you did. I'm not going to cut my own throat just for the sake of making a sale."

"Well, you certainly are frank," exploded Robinson, surveying Taylor critically. "It takes nerve to knock your own product."

"I'm not knocking my product—and why shouldn't I be frank. When I can't sell trucks on a fair and square business basis, and make them live up to what I claim, I'm done. I've checked up on that truck of yours almost every day since it went into commission, and I know exactly what I am talking about. You can do just as you please, but I've given you the facts in the case. Are you willing to make the trade I suggest?"

"Sure, if you think it is for the best, and you certainly seem to know what you are talking about—it's refreshing to find one of you fellows that does. What is more, we want two more trucks and trailers right away. We've contracted for a big acreage out in the Macon Valley, and the stuff's got to be moved faster than the railroad can handle it. We'll use them in general cartage the rest of the year. When can we get them?"

"I will have one here at 4 this afternoon, and the other will be ready at 7 tomorrow morning. Our man will pick up the big trailer at that time and leave the other, if it is agreeable to you. Your refund check will go through this afternoon."

"Never mind that refund check," snapped Robinson. "It's worth that much to find an honest man these days. What we want is those other trucks. Bronson, write a letter to Guff & Whistler and tell 'em those negotiations are all off—that we are not in the market and won't be."

HOLLEY BROS. British factory, at Coventry, is operating under the management of T. C. Copson. The plant has a capacity of 500 carburetors a week, but owing to delays in securing necessary machinery, much of which is obtained from this country and also to the scarcity of labor, the factory is not now operating under full force. The entire output at present is required by the British government for tractors, and nothing is being made but kerosene vaporizers, of which two models are being produced, one for the Ford tractor and the other of a universal pattern.

HYDRAULIC PRESSED STEEL CO., Cleveland, O., has taken over the Canton Sheet Steel Co., Canton, O., from which it secured the greater amount of its raw sheet steel stock. J. H. Foster, president of the Hydraulic company, will be president also of the Canton company. C. A. Irwin will be vice president and general manager and H. S. Renkert, second vice-president. H. H. McIntosh will be treasurer and S. H. Tolles, secretary. It is expected that a consolidation of the three properties, including the Cleveland Welding & Mfg. Co., acquired last spring, will be effected in the near future.

Western Road Builders Use Duplex Truck

The Road Commissioners of Black Hawk County, Ia., have reduced their haulage costs nearly one-half by replacing horse and mule teams with a Duplex three and a half ton four-wheel drive truck. The photograph shows the Duplex hauling a load of gravel and tools weighing 3500 lb., as well as pulling a bunk-house weighing 1500 lb.; wagon weighing 1500 lb.; cement mixer weighing 1500 lb., and eight men on the truck and wagon, weighing 1200 lb., the total weight of the vehicles and loads being 14,700 lb.

Heavily Laden Truck and Semi-Trailer Logging Outfit; One Wheel Mired

In the Heart of One of the Lumber Districts in Washington

Herewith is portrayed the midst of one of the dense forests in Washington. Although the load-carrying wheels of the truck and trailer are equipped with dual tires, these outfits are operated on a board track, as can be seen, otherwise the outfit would become stalled.

Williams "Master Form" Bevel Gearing

Has Parallel Depth Tooth Spaces Like Pentz Bevel Gears, But Larger of Mating Gears; Has Flat Instead of Curved Tooth Sides

By REGINALD TRAUTSCHOLD, M.E.

TRANSMISSION through bevel gearing is probably the one inherent weakness of present day automobile construction. In any other piece of mechanism subject to tasks even approaching the exactitude of those demanded of a car, such construction would be considered all wrong from a mechanical standpoint. No wonder then that the motorist is apt to experience more or less transmission trouble. Fortunately, this trouble is far less frequent today than formerly. Nevertheless, the transmission problem is still of the keenest importance and any new development which may tend to lessen the unavoidable mechanical difficulties of bevel gear transmission and, at the same time, materially reduce the cost of building such vital mechanism should be received with enthusiasm by the motorist as well as by the manufacturer. Exhaustive practical tests and theoretical deductions both promise that the advent of the Williams "Master Form" gearing will do much to bring about this desired result.

To clearly grasp the possibilities of Williams "Master Form" gearing, an understanding of bevel gearing is naturally necessary. Reduced to fundamental principles, such transmission may be likened to a simple pair of cones of revolution, as depicted in Fig. 1. The two cones have a common apex, and, as they transmit motion or power, the line of contact is a side element of either cone, the successive lines of contact radiating from a common apex.

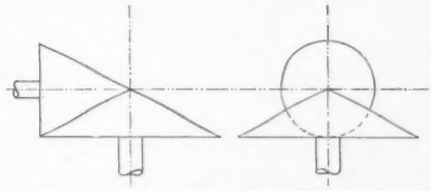


Fig. 1. Simple Cones of Revolution

Standard bevel gears differ from such cones in having alternate teeth and tooth spaces superimposed on the cones of revolution so that the teeth of one gear engage the tooth spaces of the other as they roll together. The amount of power transmitted by such a mechanism increases directly with the distance of the apex from the contact point, so that the ends of the respective cones transmit little power and may therefore be dispensed with. See Fig. 2. The lines of the contact on the teeth, the planes of the top of the teeth and of the bottom of the tooth spaces and all other longitudinal straight elements of the teeth must, however, all converge to the common apex point. That is, lines on the top of the teeth, the bottom of the tooth spaces or on any other longitudinal plane surface will, if prolonged, all meet at the common apex point of the gears. This means that the teeth decrease in width and in height from the outer circumference to the inner and, quite obviously, the curvature of their profiles must differ at each and every point.

This variation in the form of the teeth makes the accurate cutting of bevel gears an intricate and difficult operation—the main reason for their high cost. Commercially they can only be accurately produced by what are known as generating machines. These machines cause a cutting tool proportioned to represent one of the gears to roll with the metal blank to be developed into a gear, exactly as though gears were actually rolling together in required operation, the cutting tool forming the teeth on the blank. These generating machines are naturally intricate and costly mechanisms which require considerable skill for their satisfactory operation.

In order that bevel gears might be cut more cheaply and in a simpler manner, a radical departure from the proportions of standard bevel gear teeth, by which the teeth are made of equal depth from end to end of the gear was developed a number of years ago and has proved quite as satisfactory as gears with tapering depth teeth.

These gears, known as Pentz "parallel depth" bevel gears (see Fig. 3) lend themselves to being formed with rotary cutters, thus materially reducing the cost of construction. The teeth are proportioned similarly to standard bevel gear teeth at their interior ends and the same profile curvature is maintained throughout their length. This gives the gears a peculiar appearance, as the outer ends of the teeth are quite stubby, their height being considerably less than would be required for standard teeth of the same width. They may be cut and finished on milling machines, while standard bevel gears can not be so finished, owing to the variation in profile curvature of teeth. In the parallel depth gears, both the width of the tooth spaces and the thickness of the teeth decrease from outer to inner end, much as they do in standard bevel gears, so that several adjustments of the blank on the work spindle and several passages of the rotary cutter are required to finish the respective teeth. This multiplicity of adjustments is the chief item of expense in the manufacture of such gears.

On both standard and parallel depth bevel gears the curvature of the tooth profiles differs with the number of teeth to the gear, so that numbers of cutting tools are necessary for the production of gears of various sizes. Multiplicity of tools naturally tends to increased cost of production and the only justification that can be offered for the use of special tools for special sizes of gears is the claim that interchangeability of gears may thus be assured. This claim may justly be made of spur gears, which are proportioned to engage a standard rack with teeth of straight profile, but true interchangeability of bevel gears is seldom, if ever, realized.

This has been learned at considerable expense by the automobilist. Many a motorist, who has been so unfortunate as to strip a tooth from a bevel pinion, has put

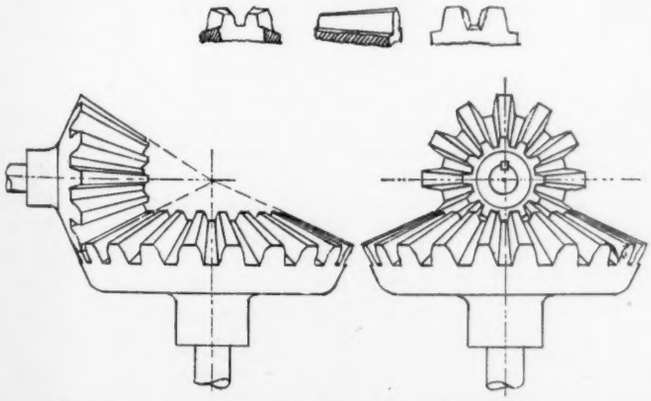


Fig. 2. Details of the Teeth of Standard Bevel Gears

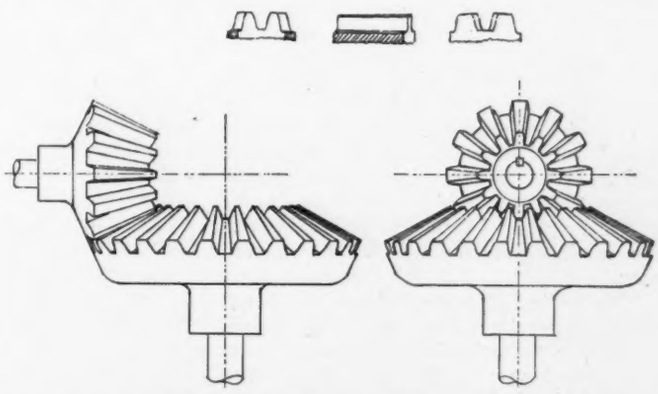


Fig. 3. Details of the Teeth of Parallel Depth Bevel Gears

Make your product pay—advertise in the CCJ

in a new pinion only to find that his new transmission did not work as smoothly nor prove as satisfactory as did his original gearing. This unsatisfactory result may be due to the fact that the gear has worn unduly, but, more probably, it is proof that even the best manufacturing skill can not assure interchangeability of bevel gears.

The parallel depth bevel gear construction naturally simplifies the cutting of teeth, by eliminating the necessity of tapering the depth of tooth, but retains the complexity caused by the radiation of profile surfaces. The Williams "Master Form" gear goes the radical step of eliminating the necessity of cutting radial teeth, while retaining the advantage of parallel depth construction. The tooth spaces of the larger of a pair of mating bevel wheels in the Williams construction are simply straight gashes in the blank, of constant depth and inclined sides. The "master form" feature of such gears is that the walls of the tooth spaces, i. e., the sides of the teeth, are plane surfaces of uniform slope, the one form being common to all the larger wheels of pairs of bevels. The thickness of the teeth of course varies from end to end, owing to the difference in the inner and outer circumferences of the gears, but the tooth spaces are uniform.

of teeth expensive. In the Williams "Master Form" gear the teeth are almost as readily cut as those of an ordinary spur rack, and each gear becomes the standard to which its mating pinion or pinions are proportioned. This does not entail any additional difficulty or expense in the manufacture of the pinions.

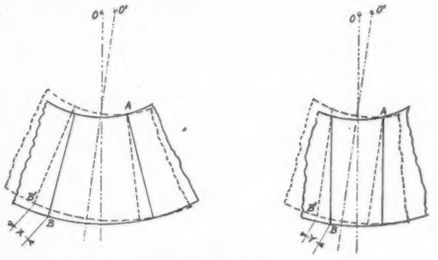


Fig. 5. Illustrating What Occurs When the Shafts Are Sprung Out of Line

The cost of cutting the gears depends largely upon their number of teeth and it has been estimated that about eighty per cent. of the combined number of teeth on the gear and pinions of automobile transmission are on the gear, or larger wheel. The Williams system reduced the cost of cutting such teeth to a fraction of that required for cutting the teeth of an ordinary standard or parallel depth bevel gear, so that very considerable reduction in the cost of the complete transmission, including both the cheaply cut "master form" gears and their mating pinions, which latter will cost about the same as standard type pinions, is accomplished.

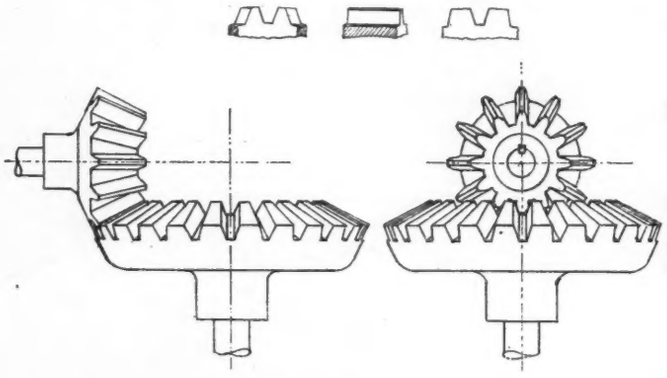


Fig. 4. Details of the Teeth of Williams "Master Form" Bevel Gears

Economy of manufacture is probably the greatest advantage possessed by this type of gearing.

The pinion meshing with this "master form" gear has teeth with curved profile. It is formed by the generating principle with cutting tools which are the conjugate of the simple tool employed in gashing out the tooth spaces in the "master form" gear.

This radical departure from the usual design of bevel gearing (see Fig. 4) is particularly noteworthy in that it is a reversion to and an adaptation of fundamental mechanical principles, which appear to have been entirely overlooked in the evolution of ordinary bevel gearing. Tooth members will roll together smoothly and efficiently providing the tooth of one and the tooth space of the other are conjugately related. This is the only requirement. Form and shape are immaterial. The development of the almost universal involute system for gearing, with its varying tooth profile for every size of gear, is based on the requirement that each and every gear be conjugately related to a rack with flat sided teeth. In spur gearing this basis of standard is eminently satisfactory, but, in the case of bevel gears, with their varying diameters, the standard creates the complexity which makes the accurate cutting

This economy in manufacture is probably the most important advantage possessed by Williams "Master Form" type of gearing, but it is by no means the only one. The peculiar shape of the teeth makes such gears exceedingly smooth running and, the care required satisfactorily to cut curved tooth profiles being limited to but one of a pair of gears, much greater combined efficiency is realized. There are also various other features of more or less technical nature which make the Williams gear highly efficient, and one of these which, to the motorist, is of extreme importance, can be graphically depicted.

It is well known that the satisfactory operation of a transmission depends largely on the exactitude of alignment in shafts. This is quite obvious, and it is also quite obvious that the strains and wrenches to which a car are subject tend to disalignment. The teeth of the gear may remain in mesh, but the shaft may be so sprung as to cause heavy unbalanced pressure, noisy operation and undue wear of gear teeth. This is almost unavoidable. The Williams "Master Form" gearing, however, discounts to a very appreciable extent the troubles produced by sprung shafts.

Fig. 5 illustrates graphically what occurs when the shafts are sprung out of line. In the case of ordinary bevel gears, and also of "master form" gearing, it is assumed that strains have been produced which would cause the transmission shaft, for instance, to spring from its correct position, shown as *"O"* to that shown as *"O¹,"* if it were not for the restraining influence of the gear teeth. The natural position of the gears with apex centers at *O* and *O¹* are, for one tooth, depicted by the full line and broken line outlines respectively.

To remain in mesh the inner corner of any tooth, such as corner *A*, must remain in contact with its mating space. If it were not for the restraining influence of the teeth themselves, the diagonally opposite corner of the tooth B^1 would naturally take some position in reference to the corresponding corner of the tooth space *B*, as shown on the diagram. The strain to which the gearing is subjected consists in forcing the corner B^1 to coincide with *B*. The distance between B^1 and *B* in the two types of gears bears then some definite relation to the amount of strain to which the teeth of the respective gears are subject. In the case of gearing with radiating teeth this is measured by the distance *X* and in the case of Williams "Master Form" gearing by the distance *Y*. Owing to the parallelism of the contact in the Williams "Master Form" construction, the distance *Y* is considerably less than *X*, so that the strain on the teeth is very appreciably less in the new form of transmission. Furthermore, the decrease in strain is very much more than the difference in length between *Y* and *X*, for, if the gears are fully loaded, the difference may be such that fracture occurs in one case and simply a strain in the other. In any event, reduction in undue wear, less noise in operation and decreased power consumption are all attained in the case of the Williams "Master Form" of gearing. This means the elimination of much transmission trouble, gained by the use of cheaper and much more uniformly accurate gearing.

ENGLERT & ENGLERT, Pittsburgh, Pa., are now distributors for Polack truck tires for Pittsburgh, Pa., west of Altoona and the state of West Virginia.

RUSSEL MOTOR AXLE CO., Detroit, Mich., has completed a one-story addition to its plant which gives an additional floor space of 26,000 square feet. With the purchase of new machinery amounting to $50,000 the output of the company will be increased sixty per cent. The capital stock of the company has been changed from $500,000 of common and $100,000 of preferred to $750,000 of common stock only. The Russel Motor Axle Co. specializes in the manufacture of internal gear drive axles for motor trucks.

The Audit Bureau of Circulations means Circulation Facts—not Unverified Claims.

Here is a Winter Equipment Necessity

Preclude Winter Skidding Accidents by Using Anti-Skid Chains. Safety First Alone Demands Proper Skid-Preventing Equipment

OWNERS and drivers of motor trucks who have not prepared themselves against the dangers and attendant disasters of skidding during the winter months, are not guilty of ignorance as much as of neglect. Every truck owner who has at any time suffered loss of capital and time, occasioned by accidents due to skidding and improper traction, can testify to the unconditional advisability of having every commercial car properly equipped with an anti-skid device.

Not only does the safety of the truck depend upon its being so equipped, but the more important safety of pedestrians is thereby made more secure. The realization of this phase of the question alone should be sufficient to induce truck owners to aid in securing safety for all.

Then we have the problem of rural transportation—trucking through country roads when ice and snow are more in evidence than good, solid road beds. The truck that is here equipped to obtain effective traction to overcome the possibilities of being stalled through not being able to travel through snow, mud, or over icy roads, is the one that will finally prove most economical and wealth productive.

No matter how light or how heavy the truck may be, the addition of an anti-skid chain will increase its efficiency and secure the safety of truck, driver and pedestrian.

Who will dispute the assertion that a driver's tranquillity of mind is an important factor conducive to his efficiency, and how much more easily will the mind of the manufacturer respond to the problem immediately confronting him, if it is unharassed by fears and apprehensions of danger and loss that would result should one of his trucks, even then wending its way through snow-and-ice-covered streets of the great city, refuse to obey the driver's guiding hand during an emergency?

Every dealer who has not already done so, should inaugurate an aggressive campaign for the supplying of every negligent truck owner with the indispensable anti-skid attachment, so that his trucks can operate more effectively throughout the winter months.

What type to use among the numerous ones on the market, is a matter that should be studied by the dealer, so that he may be in a position to advise the purchaser what particular type of attachment would be most effective on a specific type of truck, large or small.

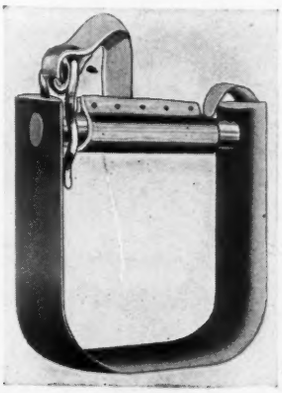
Following this article will be found descriptions of numerous anti-skid attachments that have been recently placed on the market. By closely following the particular uses to which each one is adapted and by comparing various types, some idea of the size of this definite field of winter business opportunity will be obtained. And what dealer does not desire to increase his winter business?

Interesting Descriptions With Illustrations of Anti-Skid Devices

Easyon Grip for Solid Tires

The Easyon solid tire grip is a piece of half oval steel, U-shaped to fit over the tire and rim and connected at the top by a round, leather-covered bar. The rounded side of the half oval steel is next the tire and presents a smooth even surface to the rubber. The leather coverings on the round bar across the felloe of the wheel lessen the possibility of the wood being marred.

The device is easily attached and is claimed to be unbreakable. When driving over a hard road the round bar raises up from the felloe of the wheel and thus prevents bumping. When the wheel begins to slip the attachment is pulled into a slanting position with the round bar pressing against the felloe so that a firm grip is obtained on any soft road.



An Easyon Solid-Tire Anti-Skid Grip

The Easyon grip is made in sizes to fit all solid tires. Prices range from 75 cents to $2 each, according to the width of the rim and size of tire to which they are attached.

Easyon chains for solid truck tires include single chains that fasten to the spokes. The chain is connected by a strong fastener that has a leather covered chain to fasten it around the spoke. A small snap locks the ends of the smaller and larger chains to the fastener.

Woodworth Solid Tire Anti-Skid Chain

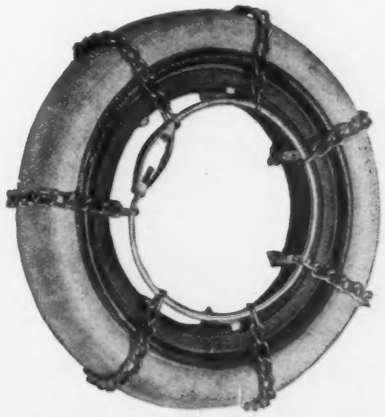
This anti-skid attachment is made in five sizes for different size single and dual tires. The prices range from $7.80 to $24 per set of twelve. The Woodworth Mfg. Co., Niagara Falls, N. Y., is the maker.

Standley Non-Skid Chains

Standley truck chains, manufactured by the Standley Skid Chain Co., Boone, Iowa, are separate units of twist-link chains that fasten around the tire and felly and are prevented from coming off while running by a steel ring to which each unit is fastened. This ring is said to act as a shock absorber, taking the immediate strain off each chain when in action and distributing the strain throughout.

The cross chains automatically tighten and bind all parts of the wheel and tire when pulling. Each unit is "anchored" to the inside of the felly which prevents the wheel from revolving inside the chains.

There are said to be no free parts to catch in the drive chains, brake levers, or other working parts. Repairs are easily made without tools and sections can be replaced at a nominal cost. This anti-skid attachment is adjustable and suitable for use on any truck. It has been approved, after testing, for Government service.



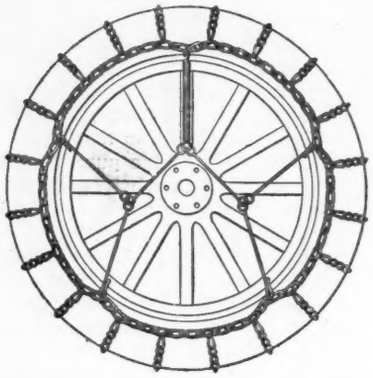
Standley Adjustable Traction Chain

The prices for Standley adjustable non-skid chains for solid tires range from

$14.75 for the single 32x3½-in. tire to $28 for size 42 x 12 in. Dual tire sizes, similar to the single type up to 42 x 8 in., cost from $17.50 to $30 complete.

Merchant Chain Tightener

A simple attachment that is designed to prevent anti-skid chains from loosening and unfastening is being marketed by M. H. Merchant, 236 Emma St., Syracuse, N. Y. The price is $1.25 per pair. This



Merchant Tightener for Anti-Skid Chains

device is suitable for use on any truck except those with large hubs having projecting bolt heads.

The assembly consists of six solid rods and a spring, ingeniously arranged and attached to the chain at five points so that all slack is taken up and an even tension is provided. The attachment is simple, light, compact, durable, and easily applied.

Attachment Secures Chain

The Non-Skid Chain Protector is designed to prevent the anti-skid chain on a tire from being lost. It consists of a button that can be quickly and permanently attached to any hub cap, and an adjustable chain. One end of the chain is snapped over the button and the other end is

Device to Prevent Loss of Chain

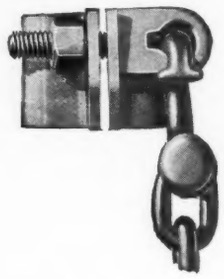
snapped to the tire chain. Should an anti-skid chain drop from the tire it is dragged along by this device, and thus its loss is prevented.

Ease of application and a comparatively low cost make this accessory a valuable addition to an anti-skid assembly. The price is $1 per pair and the manufacturers are the Bodenstein Bros., Rochester, N. Y.

Giant Grip Non-Skid Chains

Giant Grip chains, designed to prevent skidding, are made for motor trucks having solid tires. Heat-treated drop forgings are used throughout. The chains can be adjusted to various lengths and the clamps may be left on the wheel spoke permanently, if desired.

Each unit consists of a clamp, two drop-forged eye-bolts and two T-shaped drop-forged hook links, to which a cross chain, that goes around the tire and the felloe, is attached. The clamp is lined with "Gripoid" lining to protect the spokes. A special



The Clamp and the T-Shaped Connecting Link of the Giant Anti-Skid Chain

twist in the links of the chain permits it to lie flat on the tire.

The eye-bolts serve two purposes: They bolt the two sections of the clamp to the spoke and also receive the T-shaped hook links to which the chain is attached.

Prices depend upon the size and shape of the clamps required for various types of spokes. The Challoner Co., Oshkosh, Wis., is the manufacturer of the Giant Grip attachment.

Never-Skid Truck Attachments

A new type of non-skidding attachment for dual-type truck tires is being produced

Showing the Novel Construction of the Never-Skid Dual Tire Chain

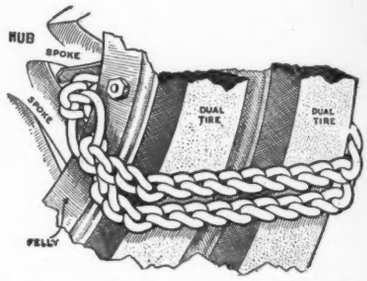
by the Never-Skid Mfg. Co., 110 W. Fourteenth St., New York City.

The crosspieces are built up of woven steel wire, which construction reduces the possibility of breakage and gives a better gripping surface. Turnbuckles in the chains that connect each crosspiece, allow for adjustment required through wear of the tires. Attachment is easily made with a special tool provided with each set.

In ordering it is necessary to specify the make, size and type of tire and the diameter in inches from center to center of the two sections. This non-skid attachment is being used on numerous government trucks and is said to be giving effective service.

Herman Truck Tire Chains

Herman anti-skid chains are designed to give effective traction in mud or snow. Each section is a double chain running across the tire and connected through rings, to another chain wound and locked around the spoke of the wheel. An even



Herman Patent Truck Tire Chains

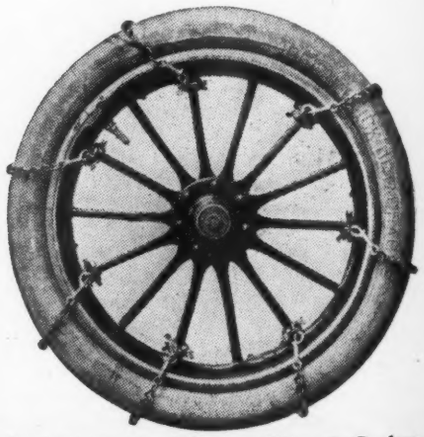
wear on all the links and a reduced vibration are claimed to be secured through this method.

The links of the chain are short and closely twisted to prevent gouging the tire and to afford better traction. Quick and easy detachment and detachment are provided. The tie-chain is secured so as not to damage the spoke and the hook is said to be positive. The small size chain is fastened to the spokes by a heavy fibre strap instead of the tie-chain.

All chains are packed in a neat bag, six units to a set. The prices are from $5.50 to $21 per set of six for single and dual truck tires. The Herman Mfg. Co., 1420 Pennsylvania Ave., Washington, D. C., is the maker.

"Bro-Gor" Chain Attachment

By fastening one of these chain assemblies to each alternate spoke the best traction and service are said to be secured. Three parts complete the Bro-Gor attachment. A clamp is fastened rigidly to the



Bro-Gor Chains Used on Alternate Spokes

Advertising appropriations bring greatest returns when expended in the CCJ

spoke by the thumb-screws that are pressed firmly upon lock washers to preclude possible slipping or loosening due to road jars. A soft leather facing on the inside of the clamps protects the structure and finish of the spoke. This clamp may be left permanently on the spoke.

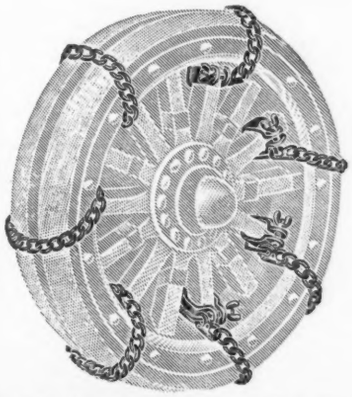
The chain is specially toughened and twisted to afford a flat surface in contact with the tire. Connection between the chain and the clamp is through a special link that facilitates attachments and repairs. Prices are quoted upon receipt of specifications such as: weight of truck, circumference of spoke at felly, number of spokes per wheel, and the distance around the rim and tire of the wheel.

This device for preventing skidding is a product of the Brockett-Gorham Co., Marion, Ohio.

Prest-O-Grip for Truck Tires

The Rowe-Calk Co., Plantsville, Conn., is offering Prest-O-Grip, an anti-skidding attachment for solid-tired trucks. It includes a clamp, two lock-links and a chain, the chain being ordered separate from the Prest-O-Grip proper.

The clamp is rubber lined and is placed permanently on the spoke of the wheel. Two drop-forged lock-links fasten the chain to the clamp. These links are easily fastened and opened and provide convenient and time-saving operation. The



Wheel Equipped With Prest-O-Grip Chains

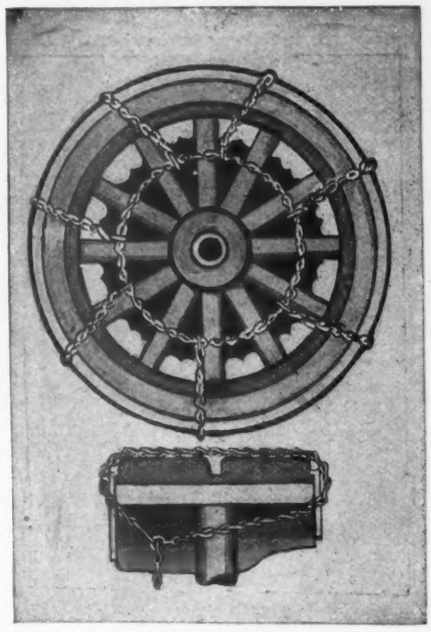
chain is special steel that provides toughness and strength. A twist in the links enables the chain to lay flat on the tire.

Effective traction is obtained with this attachment. The clamps and lock-links are supplied in separate boxes from the chains, which can be easily replaced when worn. Sizes are made to fit all types of tires and spokes. One complete set includes 14 clamps and 28 lock-links, which is sufficient for two wheels if placed on alternate spokes. Prices range from $24.60 to $30.95 depending on the size and shape of the spoke. The price of the chains per set, from 17 in. to 44 in. long, is from $5.95 to $16.10.

Naceskid Chain for Trucks

The Naceskid attachment is a new anti-skid chain being manufactured by the Naceskid Service Chain Co., Trenton, N. J.

The chain is guaranteed not to get into the drive chains or brake drums, which would result in an accident or in damaged parts. The traction obtained with this de-



Side and Section Views of a Truck Wheel With Chains Attached

vice is said to be very effective. In attaching, no holes are bored in the wheels and no clamps are used—there is nothing but chains that are attached by hand.

A rolling action during service affords an even wear on all sides of the chain which lengthens its life. This action also prevents injury to the tires. If one short chain breaks or is lost, it is only necessary to purchase one similar chain to completely restore the attachment to service.

The Jaffa Liquid Polish

The Jaffa Co., Cleveland, Ohio, is producing a cleaning and polishing liquid that is said to be free from acids and alkalies. It is also claimed that this product will not evaporate, explode or injure any surface or material it touches. It is used in cleaning and polishing autos, mirrors, furniture, etc., and can be obtained in ¼-, ½- and 1-gal. quantities.

Ilsley Lubricating Products

Ilsley's graphite Autogrease is a composition of tallow, Ceylon graphite and lubricating oil. The process of powdering the graphite and combining it with the oils is said to result in a composition that is unchangeable and that retains a uniform consistency in varying temperatures and conditions.

It is made in two grades; one for transmissions and differentials, the other for universal joints, axle bearings, pivots and other parts of the machine where direct application is possible or where compression cups are used. Its high melting point prevents it from feeding through an ordinary grease cup. In cases of 1 doz. 4-lb. tins, the price is 25 cents per lb.; in 25- and 50-lb. cans, 20 cents per lb., and in ½-bbl. and 1-bbl. lots, 17 cents per lb.

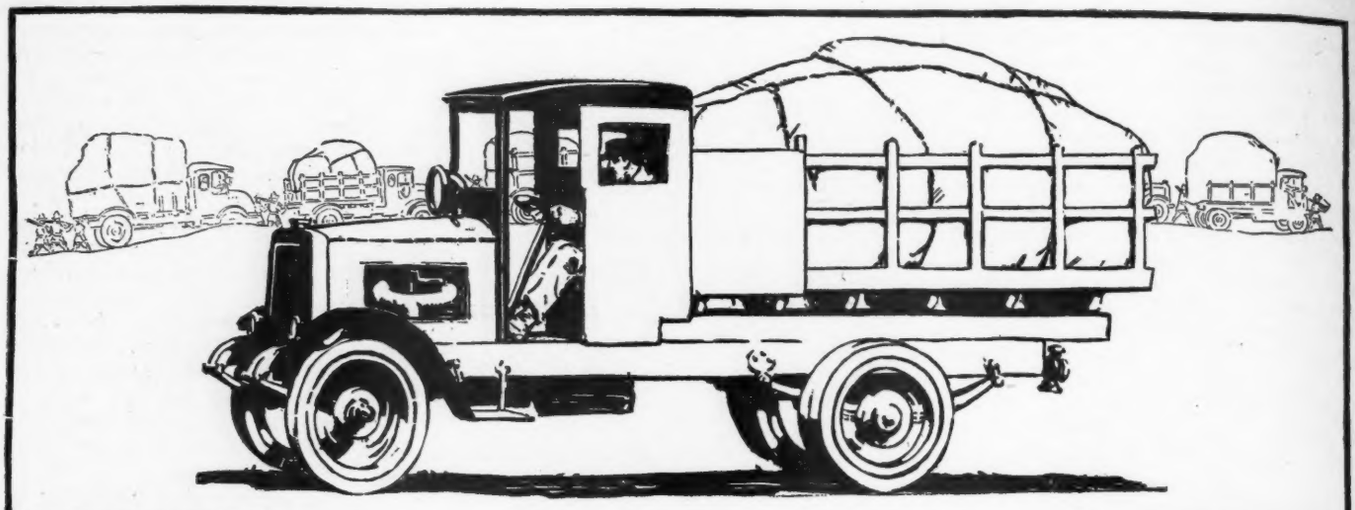
An oil for cylinders and other parts of the automobile where oil is generally used, is also made by Ilsley-Doubleday & Co., New York City. It is a viscous, greasy oil designed to withstand heat and cold. This product, known as Cyloil, is offered at prices from $1 to 60 cents per gallon, according to the quantity desired.

COLUMBIA MOTOR TRUCK & TRAILER CO., Pontiac, Mich., is increasing the size of its plant by the addition of an assembly plant, 90 x 300 ft. The output of the factory will be greatly increased by the new building, which is equipped to handle assembling in an efficient way. With increased facilities it is planned to begin work on a foreign order for 2-ton trucks, said to amount to $975,000, which is to be completed in three years.

FORD MOTOR CO., Ford, Ontario, plans to produce 10,000 trucks during the coming year. The additions recently made to the plant make possible the production of trucks, only passenger cars having been manufactured heretofore. The Ford Motor Co., of Canada, has no connection with Henry Ford & Son, manufacturers of the Ford tractor, and tractors will not be manufactured in the plant. Directors and officers will be elected as follows: Henry Ford, president; G. M. McGregor, first vice-president, treasurer and general manager; James Couzens, second vice-president; F. L. Klingelsmith, third vice-president.

Here's Some "Handwriting on the Wall" for Kaiser Bill

Now that the Second Liberty Loan has come through greatly oversubscribed, it is time for reflection on some of the advertising ideas that have helped to put the loan across successfully. The above stunt was used by the Harry Newman-Stratton Company, of Chicago.



Buy Your Motor Truck NOW!

Let One Man Handle the Hauling of Five Teamsters and Ten Horses

BUY your motor truck now or you may not get it at all. And you certainly will not be able to buy at present prices for long, even if we should be able to make deliveries later in the year.

We do not need to prove the economy and advantage of the modern motor truck as compared with horse-drawn trucks. Your competitors have proved that for both of us.

With a good motor truck of the proper size, one man will frequently replace five teamsters and ten horses. These figures will vary somewhat with the character of the hauling and the distance, number of stops, etc. But it is invariably true that a motor truck will do your hauling far cheaper and quicker than horses.

The time has come to prepare for a serious labor shortage. Your teamsters must soon go to more important work—either for the army or for the production of food and manufactured goods for the nation. If you have not already felt the pinch of labor shortage it will soon be felt. Of that you may be sure.

The best way to meet it—and beat it—is to buy that motor truck now. Then you can let four out of five drivers go into more important work—and still be sure of having your hauling done. Better still, it will be done at far less expense to you. For you will not only save the wages of the surplus drivers and the extra barn work, but you will save a great deal through eliminating your feed bill.

There is but one place for horses during this war—and that is in the army. Farmers everywhere are buying tractors and trucks to take the place of horses. They are doing this for two reasons: To lower the cost of farming—and to permit the use of more land for growing human food instead of horse feed.

Buy That Motor Truck Now

Get the Size You Want—and Get It at Present Prices!

BETHLEHEM
Internal Gear Drive
MOTOR TRUCKS
Dependable Delivery
TRACTORS
TRAILERS
DUMP TRUCKS
$1,245 to $2,565
Bethlehem Truck Co. of New York, Inc.,
1836 Broadway at 60th St., Circle Bldg.

Rainier
WORM DRIVE
HALF-TON DELIVERY TRUCK
Chassis $995 f. o. b. New York
Built in New York City by the Pioneers of America's Motor Truck Industry
Different in size only from $5,000 kind. Has every feature that save—Timken Worm-Drive, Timken axles and bearings, truck frame, truck engine and selective transmission, truck system, truck wheels—special type balloon all.
Rainier Motor Corporation
Factory, Flushing, L. I., N. Y.
Salesroom, Broadway at 61st St.

Stewart
In 5 Years No Stewart Has Ever Worn Out
¾ Ton, $845. 1 Ton, $1390
1½ Ton, $1585. 2 Ton, $2100
Immediate Deliveries.
Herrmann Motor Truck Co. (Inc.),
607-615 W. 57th Street.
Phone Columbus—6777.

Maxfer—Ford Chassis
Prices F. O. B. New York.
1 Ton Chassis, complete $725
1½ Ton Chassis, complete..... 745
2 Ton Chassis, complete..... 775
After November 5, 1917, above price increase $50.
Nickerson & Schroeder, Inc.,
1,078 Bedford Ave., Brooklyn.
Phone 2193 Decatur. Open Evenings.

Sold by
ALBERT HIRST, INC.,
2,008 Broadway Phone Col. 1111.

BETHLEHEM
INTERNAL GEAR DRIVE
MOTOR TRUCK
Built to Carry the Heaviest Load a Truck Can Handle
THE OWNER'S CONFIDENCE
EXAMINE A BETHLEHEM
Bethlehem Truck Co. of New York, Inc.,
1836 Broadway at 60th St., Circle Bldg.

Velie
¾ Ton, $940 2 Ton, $2,750 4 Ton, $3,600
Compare Velie Values with Truck Construction at Any Price.
Garland Auto Co.,
1888 Broadway, at 62d St.

BURFORD AND CO. LTD.
44 WEST 62D ST.,
ANNOUNCE
A FULL LINE OF
BESSEMER TRUCKS
1—2—3½ TON
IMMEDIATE DELIVERIES
TIME PAYMENTS

STANDARD Motor Trucks
2 Ton, $2,500 3½ Ton, $3,200 5-6 Ton, $4,000
See the Many Standards in This City, Five and Six Years in Constant Service.
No Better Trucks Built at Any Price.
Standard Truck Corp. of N. Y.
Office and Service Station,
518-520 West 37th St.
Tel. 1873 Greeley.

ALBERT HIRST, INC.
Authorized Ford Dealers.
2008 Broadway. Phone 1111 Col.
We Are Specialists in Ford Commercial Cars and Ford Trucks.
Bodies Suitable for Every Line of Business Carried in Stock.
Prices and Terms to Suit.
Phone or Write and Representative Will Call.

Reproduction of a Page From a New York Daily Newspaper, Showing Co-operative Advertising Among the Local Motor Truck Dealers

Co-operative Advertising by Motor Truck Dealers

ON the opposite page is shown a reproduction of an advertisement which appeared in a daily newspaper of New York City. It brings forth the advisability of buying motor trucks at the present time, thus releasing men for the army and labor shortages in other businesses, and as well horses for the army. It mentions the advance of prices, which is sure to come, and the uncertainty of prompt delivery.

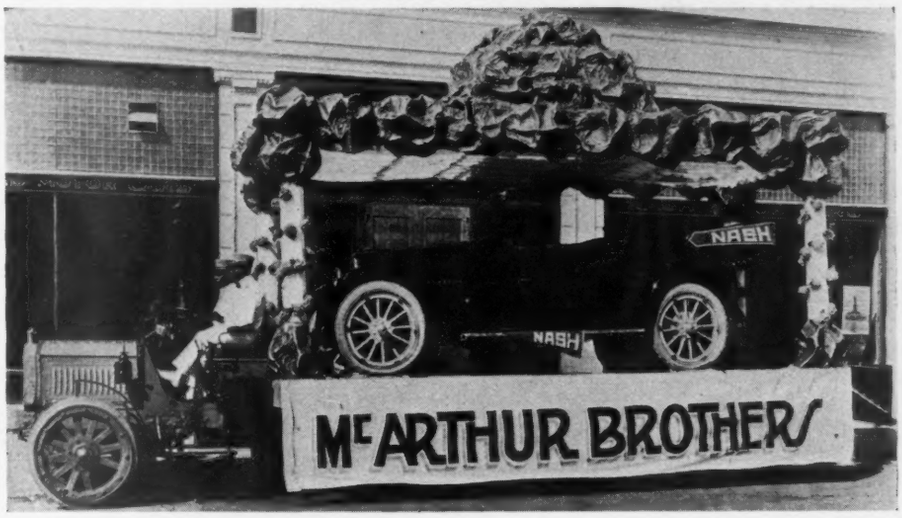
This advertisement was inserted by several motor truck agencies, or by the factory branches, each of which has equal advertising space on this page. It shows that they are all co-operating to promote the use of motor trucks. The idea of placing the motor truck foremost rather than the make of truck each sells is most unselfish. This form of advertising, which does not bring forth any particular make of truck, will undoubtedly result in many more inquiries than could possibly be received from a page of a dozen advertisements each of which would undoubtedly have the name of the truck in huge letters, with a few specifications in fine print. To insure fairness to every dealer joining in such co-operative advertising, it is desirable to place the advertisement on the last page of a section of the newspaper, so that no advertisement of any motor truck could be placed on an opposite page. This arrangement would not prevent the dealer from advertising in any other part of the paper.

The advertisement appeals directly to the user of horses and the public in general, and points out the economy and advantage of the modern motor truck as compared with horse-drawn vehicles. It advises all to prepare for the coming labor shortage, as the majority of the men in the country will be needed for the army and for the production of food and manufactured goods for the Nation.

The principle of co-operative advertising as carried out by passenger car dealers is the same. In an instance where it was tried in Boston a dealer who did not join the campaign had this to say of it afterward:

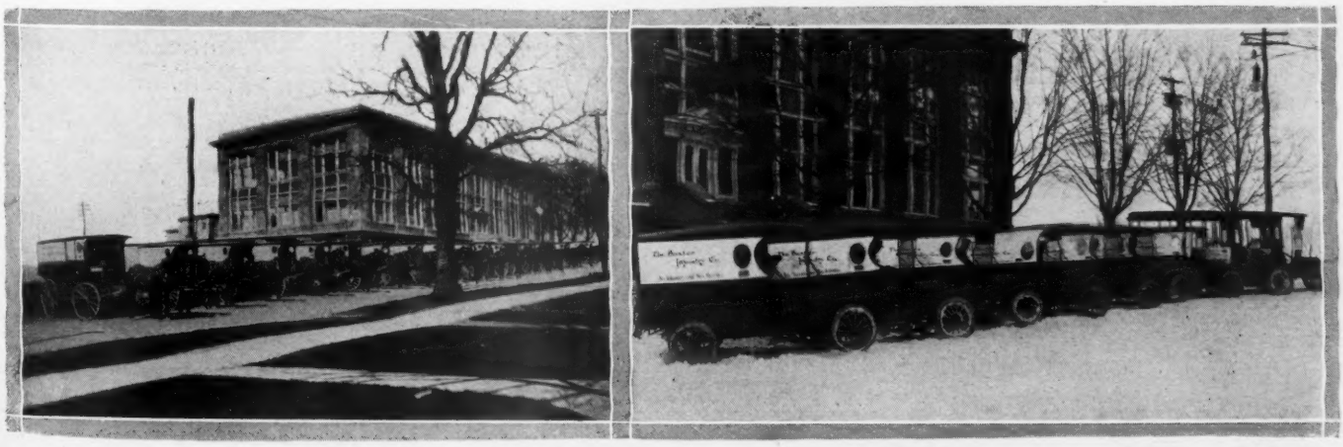
"A man came into my salesroom yesterday and asked me why I did not advertise my cars with other dealers. I explained to him that I carried as much advertising as any of the dealers in town, and used almost every paper." "I know that," he replied, "but you don't advertise with the other dealers. Two friends of mine called at my house the other evening. We all intended buying new cars this fall. Both of my friends had the list of cars and dealers from the full page co-operative advertisement with them, and we started in to select a car from that list. I noticed your agency was not among them and I mentioned the fact. Both of them replied, that if your company was not sufficiently successful to assist in paying the charge for the advertisement and not sufficiently patriotic to spend a little money for the benefit of the industry, they didn't think the car you sold was worth buying." "I am going in on the next campaign," the dealer remarked, after careful deliberation.

Several dealers have reported sales due to this co-operative advertisement and have stated that their customers selected their cars by going over the list in the co-operative advertisement. Others have told their dealers that they liked the spirit of co-operation thus shown and that they were much more ready to believe the statements of such an advertisement, made by such an array of dealers than they would if they had been told the same thing in several different advertisements.



New Nash Six is Introduced to People of Phœnix, Ariz., Through Fashion Show

The McArthur Brothers, Nash distributors in Arizona, won first prize in the Annual Phœnix Fashion Show for having the best automobile dealer's float in the parade. The top of the float was red papier mache, high-lighted with gold, and the white columns were twined with yellow chrysanthemums. Five pretty high-school girls seated in the car, added a distinctive touch to the exhibit. Thirty 20-watt lamps effectively illuminated the assemblage.

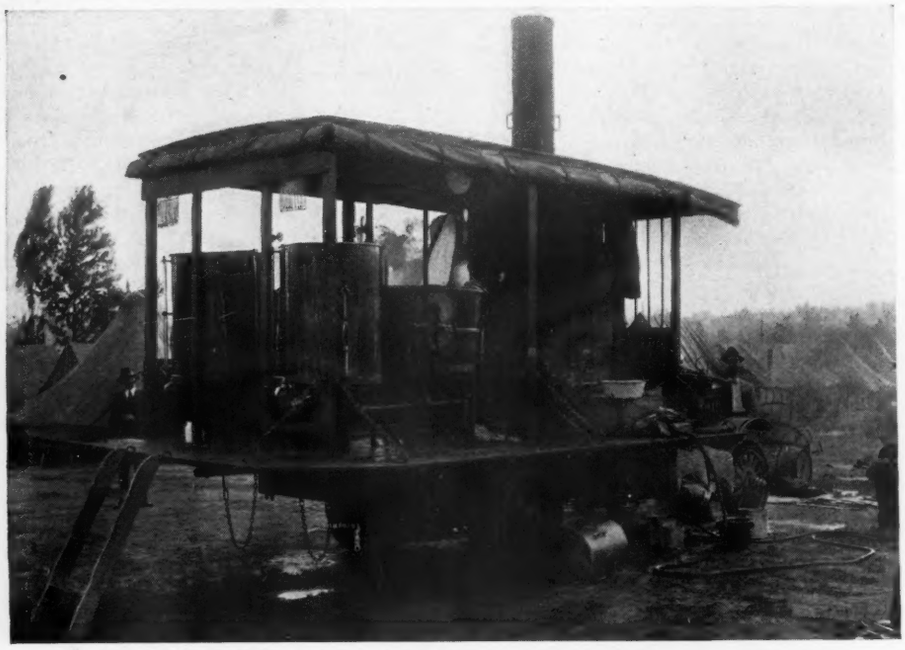


Illustrated Proof That Times Have Changed Materially in Five Years

The first illustration shows a view of the delivery teams, and was taken in 1912. Then the Baxter Laundry Company, at Grand Rapids, Mich., used twenty horses and eighteen wagons in the delivery service. In February, this year, the second photograph was snapped. The Baxter Laundry Company was then using nine motor trucks for delivery work. With more than a fifty per cent increase in the volume of business, the nine trucks did the work that the twenty horses formerly accomplished. Three more trucks have been added since that time, and work is being carried on in the rural communities. Agencies in the small towns in the county are able to insure regular service for patrons, twice a week, where formerly a once-a-week service was available by rail. The Baxter Company uses only six horses now, these for short-haul work. It is expected that the horses will be eliminated within six months.

New Type Army Field Kitchen

A new type of mobile army kitchen was demonstrated recently at New Haven, Conn., on the Yale Field. Seventeen hundred and fifty men of the 102nd Infantry were fed in less than an hour. The new kitchen is designed to serve three hot meals a day to a force of 2000 men and can provide enough coffee for 1000 men every ten minutes.



A Three-Quarter View of the Taft Mobile Army Field Kitchen, From the Rear

The Taft army field kitchen, as the unit is called, is practically a steam hotel kitchen mounted on a motor truck. It was designed by J. C. LaVin, manager of the Hotel Taft. Associated with him in its development were C. M. Bradford, who supplied the Riker truck chassis on which the unit is mounted, and H. D. Baldwin, who built the body.

The kitchen proper contains a 10 hp. steam boiler, two 90-gal. stew, soup or pot-roast kettles, and two 50-gal. coffee urns. The kettles and urns are heated both by steam jackets and by live steam injection. During the demonstration at Camp Yale coffee was boiled in less than six minutes. So compact and well planned is the arrangement that the Taft kitchen, with two cooks, is claimed to displace two company kitchen units of eighty men and forty horses. Two of these mobile units will feed a full regiment, either in camp or on the march. Being capable of a speed of almost 15 m.p.h. the unit can precede its battalion on the march, cooking a meal on the road, and be ready to serve hot food when the battalion halts. The Taft unit also improves the method of cleaning mess kits after meals by providing a supply of boiling water and live steam.

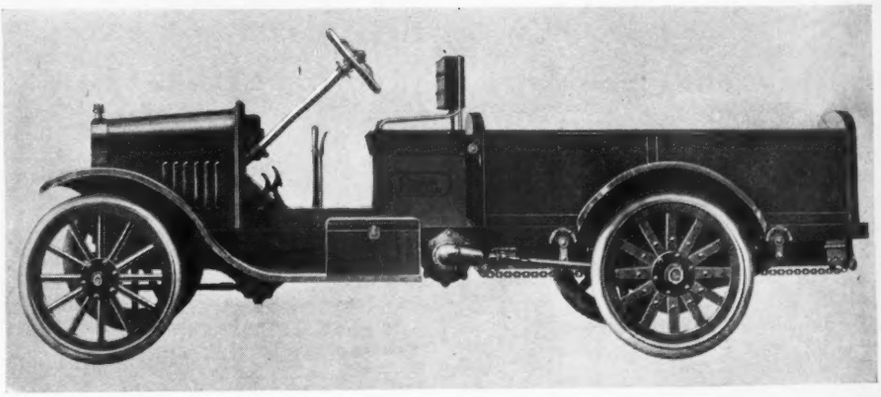
It is planned to add to the equipment a 6-kw. generator to be operated by the Riker truck engine. This would furnish sufficient current for a 40-cp. lamp in the tent of each officer, for a 12-in. searchlight and for field wireless apparatus.

Automobile Crankshaft Corporation Increases Output

By augmenting its equipment, the Automobile Crankshaft Corp., 192 Piquette Ave., Detroit, Mich., has materially increased the monthly production of crankshafts for airplane and automobile engines.

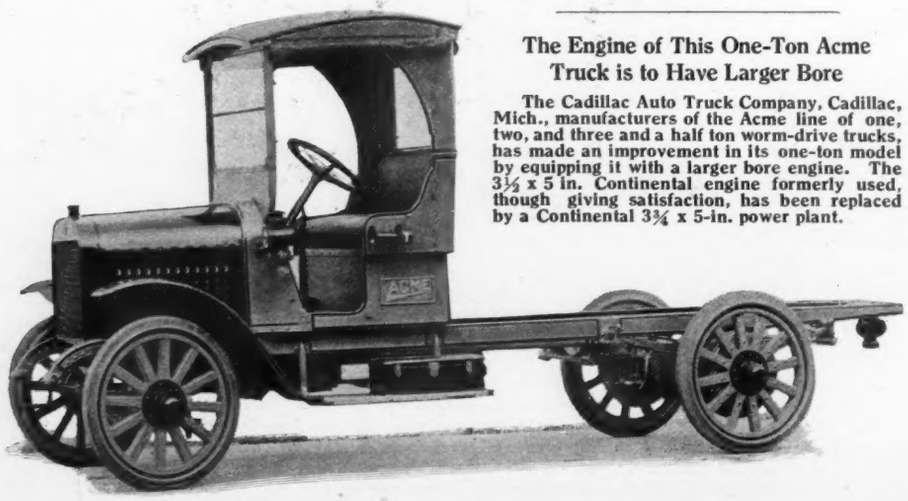
According to a recent report, the production of 4500 crankshafts during the first six months of 1917 increased to nearly 7000 per month during August. This company makes over fifty types of crankshafts for 4-, 6-, 8- and 12-cylinder engines. Some of the shafts are counterbalanced—others are plain. Holes are drilled in many of them to decrease weight and facilitate lubrication.

The prices of the crankshafts vary from $5 to $40 each, which include finishing work only. A force of 275 men is employed in the production of this product.



Side View of the Penn Drop-Bottom Body Unit, Attached to a Ford Chassis

This illustration shows the "Penn Unit," which was described in the August issue of the Commercial Car Journal, page 68. This attachment and body are manufactured, in various sizes and styles, by the Pennsylvania Steel Car Company, 501 Land Title Building, Philadelphia, Pa. The capacity of the unit illustrated herewith is one cubic yard.



The Engine of This One-Ton Acme Truck is to Have Larger Bore

The Cadillac Auto Truck Company, Cadillac, Mich., manufacturers of the Acme line of one, two, and three and a half ton worm-drive trucks, has made an improvement in its one-ton model by equipping it with a larger bore engine. The 3½ x 5 in. Continental engine formerly used, though giving satisfaction, has been replaced by a Continental 3¾ x 5-in. power plant.

Longford to be Comdelcar

The Longford Co. of America, 80 Charles River Rd., Cambridge, Mass., is announcing a change in the trade name of its product. It is now known as the Longford Auto Parts, a set of attachments that lengthen the Ford wheelbase to 136 in., making a suitable chassis for a delivery car.

On and after January 1, 1918, however, this product will be known as Comdelcar. The Longford Co. claim that this change was caused by frequent imitations, substitutes and deceptions made possible by the flexibility of the word Longford.

In the June, 1916, issue of the Commercial Car Journal, page 32, this attachment was completely described and illustrated. At that time the maker was known as the Motor Accessory Distributing Co.

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

New Four-Ton Heavy-Duty Acme Model

A FOUR-TON model D has been added to the 1, 2 and 3½-ton line of Acme trucks made by the Cadillac Auto Truck Co., Cadillac, Mich. This job is a heavy-duty machine throughout, featured by rigid construction of the frame and live members. This makes it particularly adapted to receive dump bodies, which style of body the Cadillac Auto Truck Co. makes a specialty of in their structural steel department.

Worm Drive and 50 H.P. Engine

In general this new model is a worm drive truck built for heavy hauling. It has a wheelbase of 168 in. and a loading space of 156 in. The turning radius is 29 ft. and the tread is 66¼ in. front, and 69¼ in. rear. It is equipped with a Continental 4½ by 5½ in. engine. The engine is mounted at three points, with transmission amidship, and is connected with the drive by two universal joints and with two additional universals on the propeller shaft.

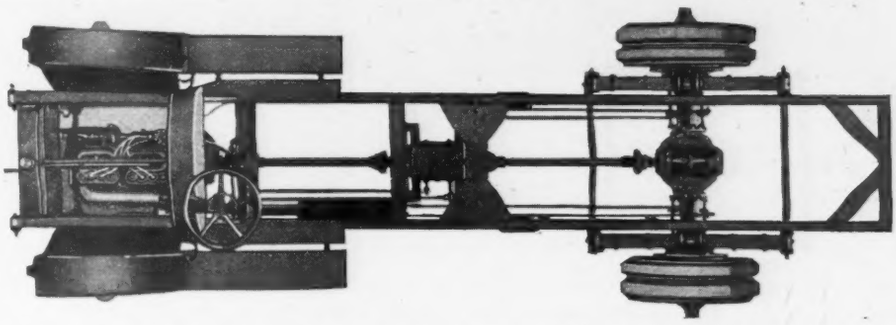
The Continental engine is a type E, fitted with a Pierce governor, limiting its speed to 1200 r.p.m. and the truck to 12 m.p.h. As in the other Acme trucks, the engine is equipped with a Rayfield carburetor, Eisemann magneto and Stewart vacuum feed.

This new model differs from the 1 and 2-ton Acmes in the mounting of the gear set. In the two smaller models this is in unit with the engine, while in the 4-tonner, similar to the 3½-ton construction, it is mounted amidship with 3-point suspension. The transmission is of the Cotta constant mesh, individual clutch type. The gears, instead of revolving with the shaft, run free and the hookup of the shaft and gears is accomplished by a series of dog clutches, one part of the clutch being cut into the face of the gear, the other part sliding upon the squared shaft.

Between the engine and the transmission the shaft is of heat-treated steel 1½ in. diameter, and the shaft between the gear set and rear axle is of 1¾ in. diameter.

Timken axles both front and rear are used. The axle shafts are forged in one piece, heat-treated and splined on one end. Service and emergency brakes are internal expanding, with 24 in. drums on the rear wheels.

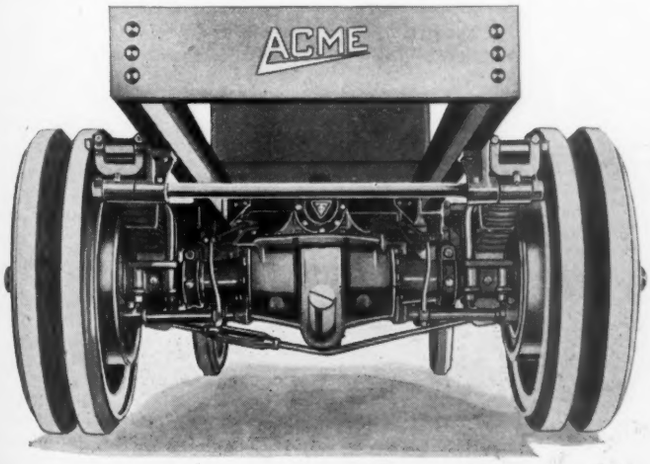
In the Acme 4-tonner the drive is taken through radius rods which are semi-flexible, thereby eliminating the necessity of universal joints and allowing of simpler connections. This also carries out the flexible connection scheme between the live members of the chassis and the chassis frame. The torque is taken by the springs in the same manner as on the smaller Acme models. All springs are Detroit semi-elliptics, self-lubricating and having bronze-bushed eyes, the front being 3 in. wide by 42 in. long, and the rear 4 x 56 in. with 14 leaves. Like the 3½-ton Acme, the 4-ton model has a cast radiator tank. The radiator is detachable and is supported from the bottom on a cushion base which absorbs vibration and prolongs its life indefinitely. It is of Long make, and receives circulation through a centrifugal pump.



A Plan View of the New Four-Ton Acme Truck, Showing the Continental Engine, Amidship Transmission, and Sturdy Cross Members and Gussets

The frame is an 8-in. section, fitted with heavy webbed cross members that are gussetted and hot riveted. The gasoline tank, made of welded steel, is located under the driver's seat, and has a capacity of 27 gallons. The wheels are of the artillery type with 2¼-in. spokes front and 4-in. spokes rear. Front tires are 36 x 5 in., and 40 x 5 in. dual tires are standard equipment on the rear wheels.

This Acme model sells at $3700 f.o.b. Cadillac. Equipment includes seat, horn, jack and tools.



Rear View of the New Acme Model. The Various Rods and Braces Certainly Give an Appearance of Sturdiness

Wilson to Make New Truck

The J. C. Wilson Co., Detroit, Mich., announces that it will add a new model to its present line of trucks. This model, due to the increased demand for trucks of large carrying capacities, will be a 5-ton truck. It is expected that it will be ready for distribution about January 1. This new truck will follow closely the design of the present line of 1-ton, 2-ton and 3½-ton models.

EDWARD V. HARTFORD, INC., announces the removal of its Chicago branch from 2637 S. Michigan Ave., to 1716 Michigan Ave. This new location affords ample space for attractive salesrooms, the Western Executive Office and for Hartford service.

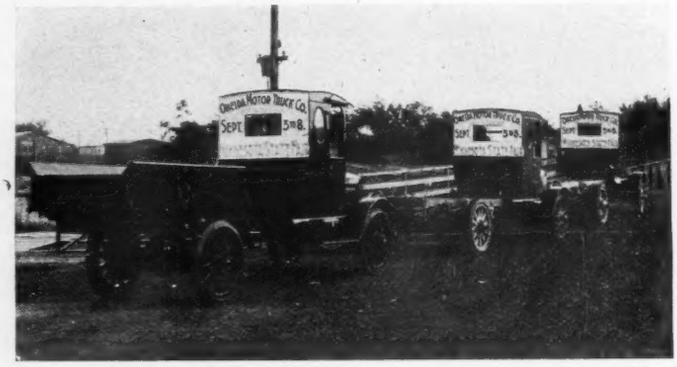
Opportunity comes to the well-informed. Read the CCJ

Oneida in Four Capacity Types

THE Oneida Motor Truck Co., Green Bay, Wis., is offering a line of 1, 1½, 2 and 3½ ton capacity trucks, which are claimed by the makers to be marked by the qualities of simplicity and durability. These trucks are provided with especially constructed spring front bumpers. The bumper is so attached to the front of the frame that spring action is afforded either when the truck comes in contact with an object or if the bumper should hook into any object in backing up. Thus it is a double acting contrivance. Another special feature is in the arrangement of the rear system, making it possible to remove axle, rear springs complete with rear wheel from under the chassis by simply disconnecting shaft and rod and eight bolts. This is made possible by the spring hanger brackets being of the split type. This is a very attractive and practical feature, as when it becomes necessary to do extensive repairing in the rear system the whole may be removed with but little trouble and placed where the work can be done under the most favorable conditions. By running the front end of the drive-shaft through an aligning bearing, supported on a cross-member, the rear of the engine, as well as the clutch, is relieved of all stresses that may otherwise be caused by the driveshaft.

General specifications of all four models are practically identical as to the use of the various parts, the only differences being relative to the different capacities as in the dimensions of the engine, springs, frame, etc.

A Continental 3¾ x 5¼ in. model C-4 engine is suspended in three points on the main frame. It is lubricated by a combination of splash and force feed. The carburetor is a Stromberg, type N-2, fitted with hot-air tube. Cooling is by positive water circulation, by a gear-driven centrifugal pump, in connection with a vertical tube radiator with spiral fins and cast iron tank. The clutch is a Hele-Shaw of the multiple disc type, running in oil. Transmission is a Cotta, model B-A. The steering gear is of the Ross worm and nut, heavy truck type, located on the left hand side. The front axle is a Timken I-beam section 2 x 2¾ in. and the rear is of the worm-drive, semi-floating type, fitted with Timken roller bearings throughout. Springs are Mather-made, of chrome vanadium alloy steel, the front measuring 2½ x 40 in., while the rear are 2½ x 54. The frame is of 5-in. rolled, structural steel channel, and its length back of the driver's seat is 130 in. Wheels are of the artillery pattern and are fitted with solid rubber, demountable or pressed-on type tires, the front measuring 36 x 3½ in. and the rear 36 x 5 in. The price of this model, fully equipped and finished in priming coat is $2000 f.o.b. factory. Equipment includes driver's seat, electric headlights, electric tail light, storage battery, front fenders, two half running boards, tool-box, battery-box, auto jack, set of tools with roll, hand-horn and speedometer.



The Three Oneida Trucks That Were Driven From Green Bay, Wis., to Minnesota State Fair

One-Ton Briscoe Truck

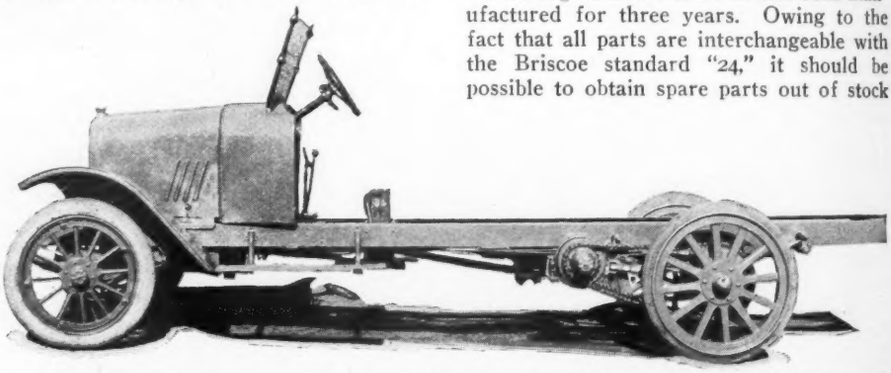
THE fundamental idea underlying the design of the Briscoe one-ton truck is to build the same entirely of standard units with a service system which has already been established.

This offering has a loading platform 29½ in. wide x 106 in. long and is supported by a very substantial frame made of 5-in. rolled channel section. The wheelbase is 132 in. and rear driving wheels have 34 x 3½-in. solid pressed-on tires.

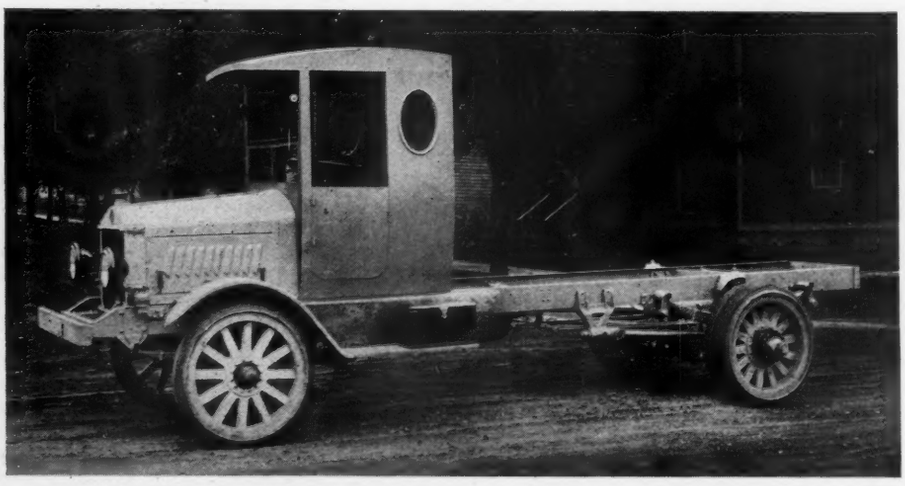
The engine is the same as has been manufactured for three years. Owing to the fact that all parts are interchangeable with the Briscoe standard "24," it should be possible to obtain spare parts out of stock from a Briscoe agent in any part of the country. The crankshaft is counterbalanced, which decreases the vibration and therefore prolongs the life of the bearings. A clutch of the cone type is used, and auxiliary springs are placed under the clutch fabric, making the engagement very easy and thus materially increasing the life of the truck. By placing the transmission in unit with the jackshaft, the same is made very accessible and the weight distribution is improved. The jackshaft is made of chrome nickel steel, specially heat treated and furnished with large Hyatt bearings. The differential can be inspected, adjusted or removed by taking off the rear housing cover.

Emergency brakes are located in the rear axle drums, while service brakes are placed on both ends of the jackshaft hubs. This location makes it particularly accessible and any wear can easily be taken up.

Attention is drawn to the comfortable position of the driver's seat. The front springs are light and resilient, thus eliminating vibrations that are destructive to power plant and radiator.



T-24 One-Ton Briscoe. Parts Are Interchangeable With the Standard Model 24



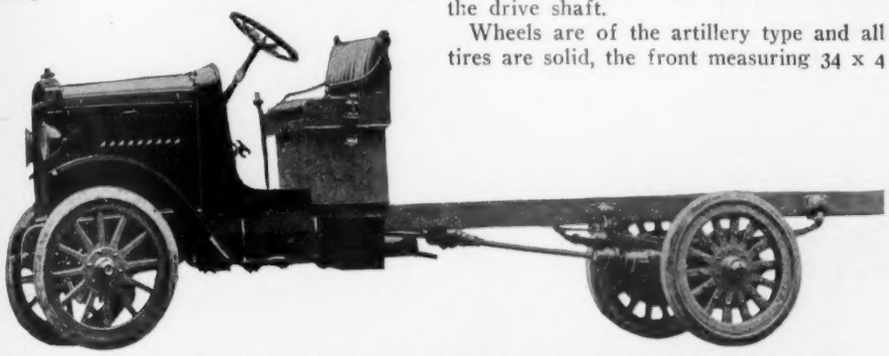
Side View of Three-and-a-Half-Ton Oneida, With Driver's Cab. The Wheelbase is 160 in.

"A little knowledge is a dangerous thing." The CCJ keeps you fully posted

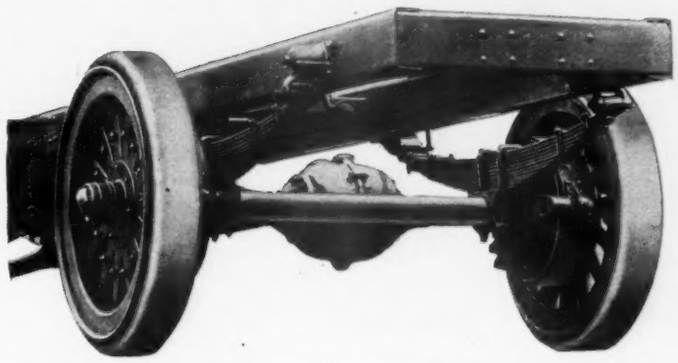
Nash Makes Addition to Its Line—A Two-Ton Truck

As a complement to their present line of trucks the Nash Motors Co., Kenosha, Wis., announce the Nash two-ton designed to be a medium between the one-ton unit and the four-wheeled drive Nash Quad.

The new Nash two-tonner is designed along the conventional standard lines and built with emphasis upon sturdiness and dependability. Only high grade materials are used in its construction and it is reported that in every way this truck maintains the high Nash standard of construction.



The Nash Two-Ton Truck, Which Sells for $1495, and Has Standard Wheelbase of 144 in.



Three-Quarter Rear View of the New Nash Two-Tonner, Showing the Special Dead Axle for Carrying the Load

Specifications of the Model 3017

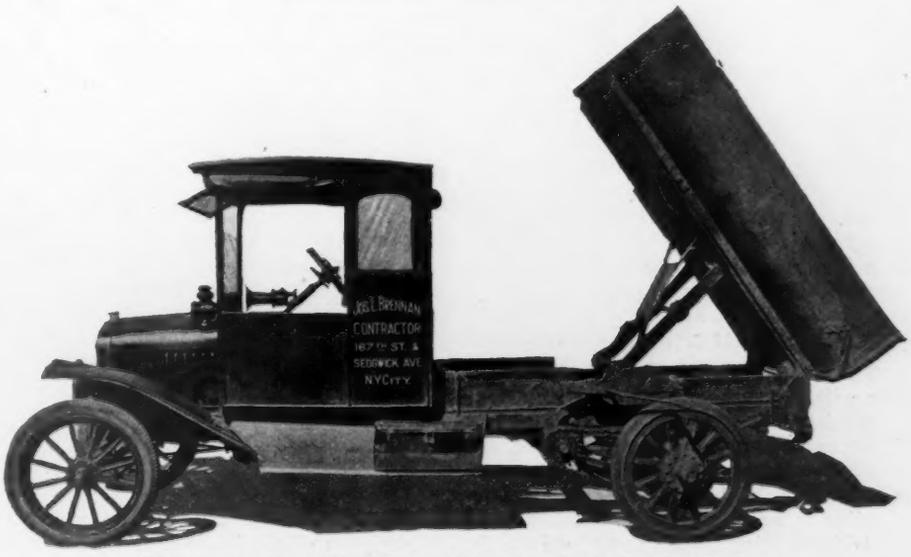
The maximum permissable weight on the chassis, including body, load and special equipment, is 5500 lb. A 4¾ x 5¼ in. four cylinder, L-head engine with S. A. E. rated h.p. of 22.5 is the power plant. The cylinders are cast in block and the engine is suspended at three points. A Simplex governor cuts off the gasoline supply at 16 m.p.h. Cooling is by a centrifugal pump and the whole cooling system may be completely drained to prevent freezing. In connection with the cooling system is a five gallon cast tank radiator, with removable tubular cores. Ignition is by the Delco system, in connection with a storage battery. Lubrication is a combination of force feed and splash, and a plunger pump operates from the eccentric on the camshaft. A Stromberg Model M-2 carburetor, provided with hot-air intake is fed by gravity from a tank under the seat. The clutch is of the dry plate disc type, and is located in the flywheel. The transmission is of the regular selective type, three speeds forward and one reverse, and is in unit with the engine and clutch. Frames are of pressed channel steel, measuring 6 x 3 in. and are of ¼-in. stock. The front axle is a drop-forged, I-beam section, 2 3-4 in. deep by 2 in. wide. The rear axle is an internal gear drive, and a special steel beam dead axle carries the load. Service brakes are external contracting on the rear wheels and emergencies are external contracting on the drive shaft.

Wheels are of the artillery type and all tires are solid, the front measuring 34 x 4 in. and the rear 34 x 6 in. Standard wheelbase is 144 in., giving a frame length of 120 in. back of the driver's seat, while a special wheelbase of 168 in. gives a length of 144 in. back of the driver's seat. Equipment includes electric lighting and starting system, driver's seat, tools, horn and jack and the price of the standard chassis is $1875. The one-ton Nash truck, Model 2017, sells for $1495, and the Nash Quad, Model 4017, sells for $3250.

Care Lengthens Tire Life

Many truck owners have the idea that solid tires are so sturdy that they need no special care and that no amount of overloading will have any effect on the life of the tire. Now, a solid truck tire will endure a certain amount of strain and no more. When rubber is compressed to a certain point, its compressibility ceases, and any pressure beyond that point causes the rubber particles to crack and separate from each other, and the tire is weakened so that it becomes susceptible to common injuries. The life is crushed out of the tire and it never resumes its former resiliency. Overloading is one of the greatest abuses to which truck tires are subjected, and it injures not only the tire, but also increases the cost of operation greatly through the injury done to the truck itself. R. S. Wilson, manager of the truck tire department of the Goodyear Rubber Co., recommends these points to the consideration of truck owners, advising them to use care in the loading of their trucks, and if there is any danger of overloading, to equip the truck with oversize tires.

The Goodyear Co. has now a fleet of five trucks, equipped with cord tires, hauling tires between Akron, O., and the company's eastern branches, and has thus an opportunity of putting into practice its theory that care in the loading of the truck will lengthen the life of the tire.

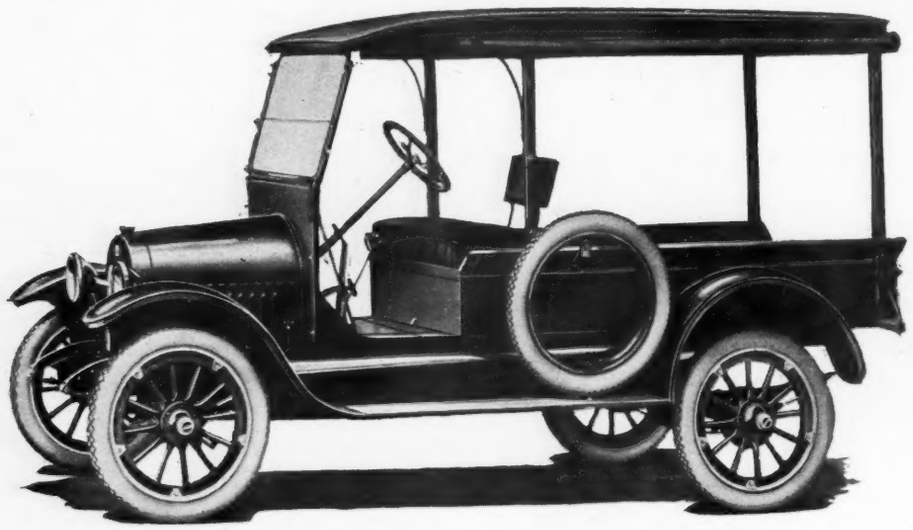


Woonsocket Rear-Elevating and Dumping Body for Ford Units

Herewith is shown one of the latest types of all-steel bodies offered by the Woonsocket Wagon Manufacturing Company, of 2-38 Worrall Street, Woonsocket, R. I. It is the special rear-elevating and dumping type for Ford units, and is seen in the dumping position. This type of Woonsocket body was described in the October issue, page 32, the lower illustration accompanying the description, however, being inadvertently shown inverted.

Buick Light Delivery Model

ANOTHER addition to the Buick Motor Co.'s line is the valve-in-head light delivery truck, which has been built to meet the requirements of merchants whose load will average about 500 lb. The chassis is the same as that under the E-4-34 and -35 pleasure car bodies. Heavy sills and cross-members are employed in the construction of the body which is securely fastened to the frame. The top supports are braced with iron inside and out, and are firmly secured with large bolts. The floor, side and flare board are reinforced with strap iron, insuring strength and long life. The inside of the body measures 42½ x 70 in., including the space under the rear of the driver's seat. In stormy weather the body can be quickly made waterproof.



Buick Valve-in-Head Light Commercial Car on the E-4 Chassis

Running boards are provided on both sides, from which the car may be loaded or unloaded. The end gate is held in place by a hook on each end, and may be quickly dropped or put up. The battery and tools are carried beneath the seat, where they are well protected and easily reached. A spare tire carrier of special construction is located on the left running board. The windshield is of the slanting type, and the driver's seat is fitted with upholstered cushions built over a strong spring frame.

Specifications of the E-4 Chassis

The engine is a 3⅜ x 4¼ in. four-cylinder valve-in-head, and is in unit with the transmission. Cylinders are semi-steel block castings, with detachable heads, and pistons and connecting rods are exceptionally light. The brake horse power is 35. Cooling is by water in connection with a centrifugal circulating pump driven by spiral gears, and a cellular type radiator. A pressed steel radiator fan is driven by an adjustable flat belt from the camshaft. Lubrication is by the self-contained, constant level, circulating splash system, operated by a gear-pump driven by spiral gears from the camshaft. The carburetor is of the automatic float feed type, supplied by the Stewart-Warner vacuum feed system from a gasoline tank mounted under the frame. Ignition is by the high tension jump spark system, current being supplied by a Delco generator and storage battery. There is a complete Delco single unit system for electric starting, lighting and ignition. A leather-faced cone clutch is equipped with expanders under the leather to insure smooth action. The transmission is of the regular selective sliding gear type, having three speeds forward and one reverse. Drive is through a single universal joint, and a fully enclosed propeller shaft to the bevel gears in the rear axle. The rear axle is of the three-quarter floating type, and the shafts are mounted on roller bearings. Service brakes are of the external contracting type, while the emergencies are of the internal expanding type, both operating on rear wheel drums. The front axle is a drop forge I-beam section, heat-treated. Wheels are of the wood, artillery type, having twelve spokes and being fitted with demountable rims. Tires are 31 x 4 in. clincher type, being non-skid, front and rear. The steering gear is of the semi-irreversible, split, nut and worm type, with a large adjustable ball thrust bearing to take up wear. The frame is of reinforced pressed steel, channel section, fitted with four heavy cross members. Springs are long and flat, semi-elliptic both front and rear. The wheelbase is 106 in. and the price $790 f.o.b. Flint, Mich.

Woonsocket Body Illustration

In the October issue, page 32, in the description of the Woonsocket rear-elevating and dumping body the lower illustration, showing the body in its normal or lowered position, was inadvertently shown inverted. This body is manufactured by the Woonsocket Wagon Mfg. Co., of 2-38 Worrall St., Woonsocket, R. I.

Knickerbocker Three-Ton Form-a-Tractor Unit

The Knickerbocker Form-a-Tractor is attached to the Ford car and is designed to utilize the maximum effective horsepower of the engine in moving the pay load and the minimum in overcoming vibration and moving the dead load. The Ford car with this attachment has a 3-ton capacity.

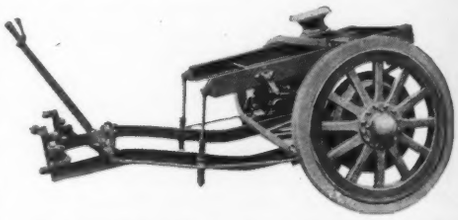
In attaching, no alteration is made in the springs, transmission or rear axle, and reconversion is easily effected at any time. The body of the Ford, back of the driver's seat, the rear wheels and rear fenders are removed. Roller pinions replace the rear wheels, the frame of the attachment is placed under the Ford chassis and the forward ends of the tractor frame clamped to the Ford frame where a pivot connection tends to take up shocks.

Appearance of an Attached Form-a-Tractor

The frame is channel steel and carries the weight of the loaded trailer and supports the rear of the Ford car.

The Form-a-Tractor wheels operate on a 2¼-in.-round dead axle. The drive is internal gear, roller type, enclosed. Roller bearings are used. The springs are 32 x 2½ in.; the brake is 2½ x 19 in., internal contracting; the wheels are 34 x 4 in. and are equipped with S. A. E. solid rubber tires. The wheelbase is either 102 in. or 114 in. A gear ratio on high of 14:1 gives a speed of 10 m.p.h.

The distance from the seat to the center of the axles is either 33 or 45 in. No holes are drilled in fastening. Buffer springs are provided to take up vibration and the starting strain of the load. A water circulating system of the ejector type and a large fan are included to provide proper cooling.



The Knickerbocker Form-a-Tractor, Showing the Attachment Features

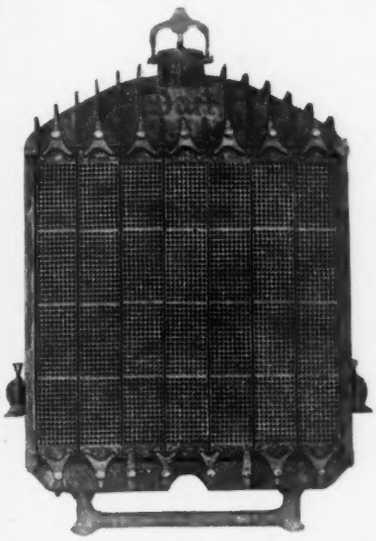
The price at which the Knickerbocker Motors, Inc., 170 Broadway, New York City, offers this attachment is $450, including a fifth wheel or a ball-and-socket universal joint.

AUTOMATIC CONTROL TRAILER CO., Columbus, O., is enlarging its equipment for the manufacture of automobile and truck trailers.

Advertising in the CCJ is memory insurance. "Out of sight, out of mind," you know

Dart Truck Has New Radiator

The Dart Motor Truck Co., Waterloo, Iowa, is equipping the latest models of Dart 3½-ton trucks with a new radiator. The construction follows the usual type in having a cast tank at the top and bottom. The top tank is finned to increase radiation and



The New Radiator of the Dart Truck

is equipped with a special cap designed to remain tightly fixed to the tank. The core differs from the usual construction in that it is composed of seven separate sections each independent and held in the casing by separate clamps. These cores are of the honeycomb type, 4 in. deep, giving a large cooling surface. In case of damage by accident, any of these sections can be removed by loosening two bolts. Such removal does not disturb the other sections, as each section has a separate opening into the top and bottom tank and is equipped with individual gaskets. Plugs for the openings into the top and bottom tank and extra gaskets are furnished with the truck and are carried in the tool box.

Repairs to any section can be made without tying up the truck and replacements are economical because only the sections damaged need be replaced. Both sides of the radiator are connected with the circulation system, giving an even flow of water. The total capacity of the radiator is approximately 15 gal.

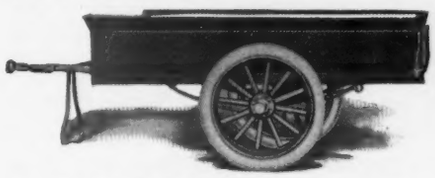
The radiator is mounted on ball and socket trunnions facilitating easy removal and allowing for weaving action of the truck.

Stockbridge and Springfield Two-Wheeled Trailers

A semi-trailer with a capacity of one ton, suitable for use with a Ford runabout and using a Martin rocking fifth wheel, is being marketed by the Stockbridge Body Co., Springfield, Mass. It is claimed to be remarkable for it lightness, strength, power, inexpensiveness and economy.

The body of the trailer is the standard express type with wing sides, tail gates and six removable stakes. It is painted black with yellow striping to match the Ford. The inside demensions are 3½ x 12 ft.

A Timken roller bearing axle, 1⅝ in. square, is used. The springs are 1¾ in.



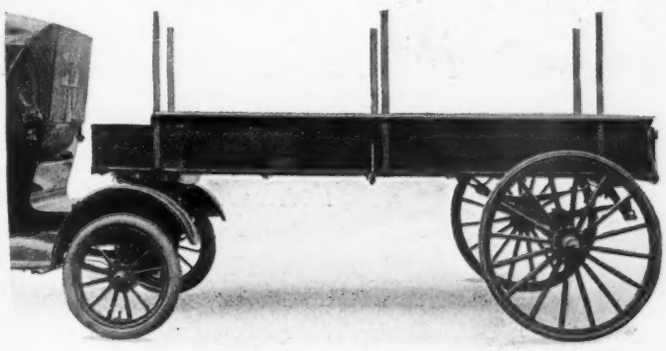
The Springfield Two-Wheel Trailer of the Stockbridge Body Company

wide, platform type. The wheels have artillery type hubs and are 46 in. outside diameter, with 1⅝ in. spokes. They are equipped with 1¾ in. solid tires. The semi-trailer comes complete with a fifth wheel connection ready for attaching to a Ford runabout. The price is $195 f.o.b. Springfield.

A 1½-ton semi-trailer having heavier springs and tires than the lighter model is offered for $225. Other specifications are similar to the 1-ton type.

The Springfield two-wheel trailer with a capacity of 800 lb. is also manufactured by the Stockbridge Body Co. It has an express type body equipped with semi-elliptic, underslung, oil-tempered springs, 1½ in. wide with seven leaves. Ball bearings are used on a 1¼-in. axle and the wheels are automobile type with 12 spokes. The pneumatic tires are 30 x 3 in.

This trailer sells for $125 f.o.b. Springfield, Mass.

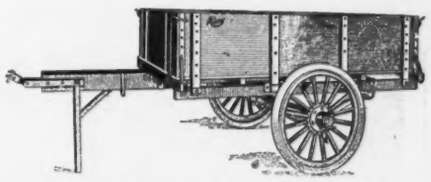


The Stockbridge Semi-Trailer Attached

Moreland Motor Truck Co., Los Angeles, Cal., is erecting its plant at Burbank, Cal. The old plant will be abandoned, but will be retained almost intact for service and special body building. The company is planning to manufacture two types of tractors—30 h.p. and 75 h.p.—on a large scale, and will commence production as soon as its $1,000,000 plant is completed.

King Trailer and Semi-Trailer

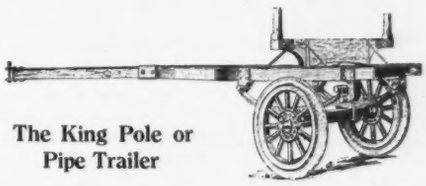
Various types of trailers and semi-trailers suitable for use in different industries are being manufactured by the King Trailer Co., 620 Main St., Ann Arbor, Mich. The trailers are made in capacities of from ½ to ¾ tons. They are built to withstand



One of the Two-Wheel King Trailers

hard, constant use over all kinds of roads, at automobile speed.

The body frames are hardwood and the drawbar is oak. A special King steel coupling, having a universal motion and designed to absorb all shocks, is used. The axles have ball bearings, and automobile-type springs absorb road shocks. The artillery-type wheels are equipped with solid truck-type tires guaranteed for 7000 miles.

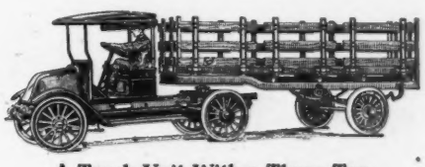


The King Pole or Pipe Trailer

The trailers are furnished in capacities of 1000, 1200 and 1500 lb.

The King semi-trailers are also made in three sizes—1½, 3 and 5 tons. Roller bearings and a standard 56-in. tread are common with all three types. The body of the 1½-ton model is 5½ x 12 ft. It is 43 in. high and is equipped with 42x2½-in. springs and 1½x2½-in. axles. The tires are 34 x 3½ in.

The body on the 3- and 5-ton models is 5½ x 14 ft. The 3-ton type has a height of 43 in., 42x3-in. springs, 2x3-in. axles and 36x5-in. tires. The 5-ton semi-trailer is 46 in. high and has 36x6-in. tires, 48x3½-in.



A Truck Unit With a Three-Ton King Semi-Trailer

springs and 2½x3½-in. axles. The King semi-trailers use the King-Irwin fifth wheel.

King semi-trailers are suitable for use around mills, factories, lumber yards, coal yards, dairies, storage and moving companies, etc.

Bearings Co. of Pennsylvania has opened a branch office in New York at 1864 Broadway, and has also installed a sales agency at 293 Halsey St., Newark, N. J. This company manufactures bearings and the Gill piston ring.

Fruehauf Trailers Haul Heavy Loads Economically

Built in three models, for 4-, 6- and 10-ton capacities, Fruehauf trailers are especially adapted to carrying heavy loads. The prices for the different models are $650, $750 and $1350, respectively.

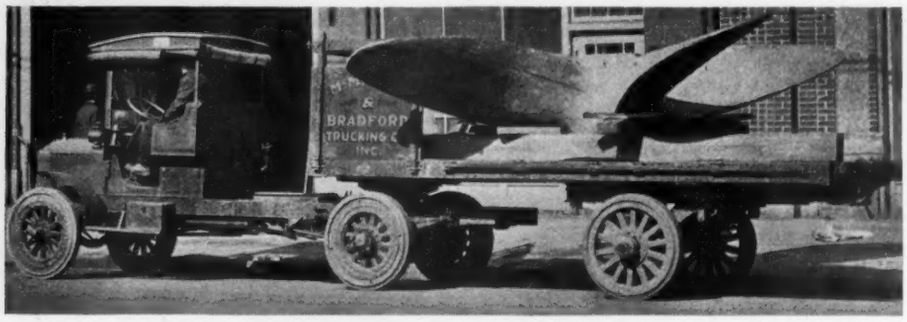
The 6-ton model, an illustration of which is shown herewith, has a 6-in. steel channel frame, 16 ft. long and 6 ft. wide. It is hot riveted and has a ½-in. steel gusset on all four corners. Four cross-members increase the strength and rigidness of the frame.

The springs are semi-elliptic of special design, 3 in. wide and 48 in. long. They have 19 leaves and are carbon steel. The axle is square, with Timken roller bearings. Heavy artillery-type wheels of hickory are furnished. They have fourteen 2½-in. square spokes. Solid, 36 x 6-in. Goodrich or Firestone tires are used. The weight of the chassis is 3100 lb. The price of the Martin rocking fifth wheel for this model trailer is $85.

The 4-ton model is similar to the 6-ton model, but has a 5-in. steel channel frame, 14 ft. long by 5½ ft. wide, with 4-in. I-beam cross-members. The springs are 48 x 3 in. with 14 leaves. The tires are 36x4-in. solid.

The 10-ton type has a heavy steel 16x6-ft. frame of the same construction as the others. The springs have 23 leaves. The wheels have 4-in. square spokes and are equipped with 36x12-in. Giant Firestone or 36x6-in. dual Firestone or Goodrich tires.

Connection to the trucks is through a Martin rocking fifth wheel, the price of which is $65 for the 4-ton trailer and $110 for the 10-model. These equipments are made by the Fruehauf Trailer Co., 1571-77 Gratiot Ave., Detroit, Mich.



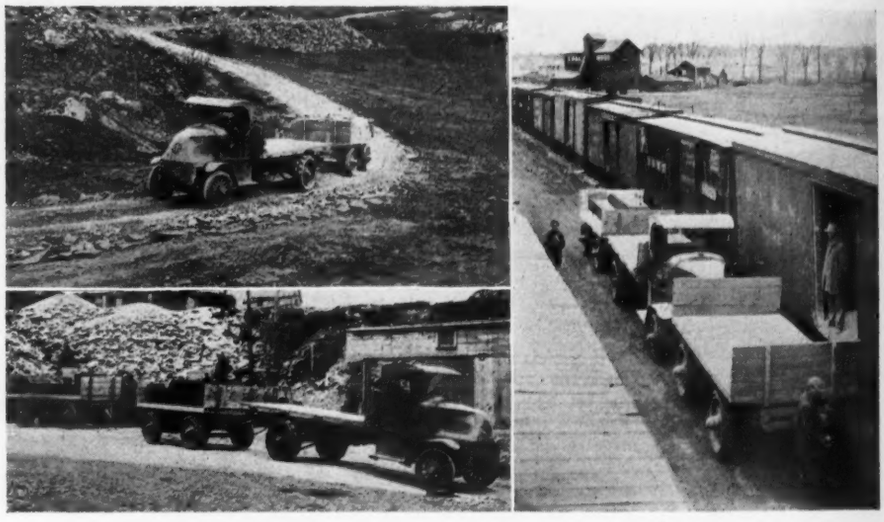
Six-Ton Fruehauf Trailer, With Stakes and Racks Removed. Propeller Weighs Ten Tons

Works Trailers in Relays

Three Troy trailers, working in relays in conjunction with a Mack truck, are used in transporting slate stone from the quarries of Hugh G. Williams, Granville, N. Y., to the railroad. Hauling 6 tons, the round trip of 3 miles is made in 30 minutes.

The loss of time incident to loading and unloading is eliminated by using three trailers, loading one at the quarry, trailing one to the railroad and unloading one at the railroad. The owner of these trailers and truck asserts that about 4 miles are obtained from one gallon of gasoline when hauling the trailers.

The Mack truck is used exclusively for tractive purposes. The cost of operating is said to have been reduced one-half by saving the time required to load and unload the truck. Negotiating the sharp turns in the roads is a simple matter when the trailers are used. The sturdy-looking trailers are made by the Troy Wagon Works Co., Troy, Ohio.



Troy Trailers, Working With a Mack Truck, Do Effective Work for Slate Manufacturer

A Quick and Easy Method Used to Unload Logs From the Semi-Trailer Outfit

This illustration shows a G. M. C. Truck and Semi-Trailer in use near Clinton, Washington. The huge logs are being rolled down into the waters of Puget Sound, the splash of one of these being plainly seen.

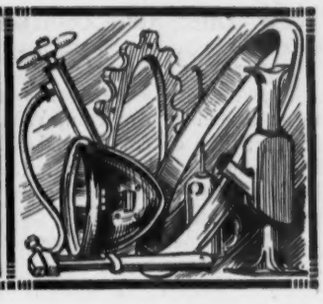
St. Louis Truck Dealers Form Organization

An outgrowth of the meetings held to plan the truck exhibit for the "Open Week" display of enclosed cars and trucks at St. Louis is the St. Louis Motor Truck Dealers' Association. During these meetings the truck dealers discovered that co-operation would aid materially in the solution of many common problems. Charles E. Paggett of the Federal Truck Co. was made temporary chairman and W. E. Conway, of the Garford Truck Co., treasurer. Two plans of organization were discussed—one to form an independent association, the other to make it a division of the Automobile Manufacturers' and Dealers' Association. A definite plan will be decided upon at a future meeting.

H. J. Koehler Motors Corp. has recently placed the following agencies: King Sales Co., 723 Granby St., Norfolk, Va.; Nickerson & Schroeder, Inc., 1078 Bedford Ave., Brooklyn, N. Y.; Hoagland & Thayer, Inc., 300 Washington St., Newark, N. J.

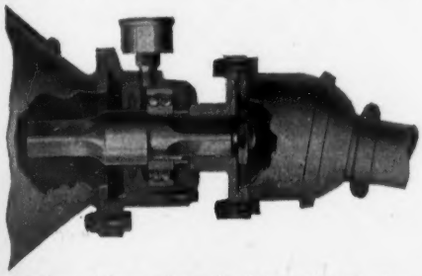
Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

TRUCK ACCESSORIES AND APPLIANCES



Tonford Attachment in Chain and Internal-Gear Drives

The frame on both models of the Tonford is pressed steel, reinforced with extra large gusset plates, and extending to the radiator of the Ford. Three bolts on each side fasten it rigidly to the Ford



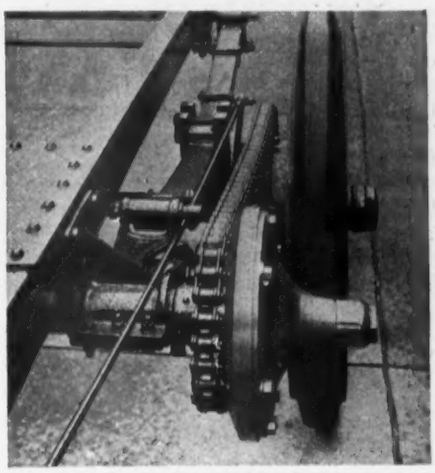
Cut-Away View of Tonford Bearing Device

frame, and the extra clearance between it and the Ford frame allows easy access to the bolts of the latter that secure the Ford engine.

On the internal-gear driven model, employing a 2¼ x 1¾-in. square Torbensen axle, the load is carried on the dead member, while the live member drives, thus allowing easy access to the differential and pinion gears. The drive is through the gear inside of the brake drum, which gives it the advantage of being nearer the rim. A feature of this model is the patented shaft extension device that bolts on to the rear of the Ford transmission, displacing the Ford universal joint and using the maker's universal joint construction, running in grease and enclosed in dust-proof metal cases. This device is a chrome-nickel shaft, ground to size, on which an S. K. F. self-aligning bearing is mounted. This bearing takes backward and forward thrusts, and all whipping motion. There are felt washers at both sides of the bearing device to keep it free of foreign matter. The shaft extension is enclosed in a crucible steel housing.

On the chain driven model there are no alterations to the Ford axle. A device known as the split sprocket is employed, permitting the use of smaller sprockets and giving the benefit of a standard tread and a clearance of 8 in. between the road and the sprocket. The massive radius rod is designed to swivel in any direction, bronze bushings being used at points of wear.

The bracket used on the Tonford, designed to hold the Ford axle rigidly, forms a point of suspension for the front end of the rear springs, and serves as a point of attachment for the radius rod. The springs in the rear are mounted on a cross rod, the ends of which are hardened to insure durability. The springs are semi-elliptic, 46 in. long, 2¼ in. wide and 3⅜ in. thick. The wheels are 32 in. diameter of the artillery type with twelve 2-in. square spokes. They are equipped with 32 x 3½-in. standard pressed-on type tires. When attached to the Ford chassis the wheelbase is 126 in.



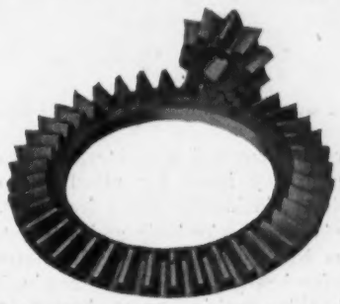
Showing the Split Sprocket, Chain, Springs and Method of Attaching

The weight, including the Ford chassis, is 2100 lb. and the loading space from the driver's seat is 120 in. Detailed specifications of each model can be obtained by addressing the manufacturer, the Detroit Truck Co., Detroit, Mich.

Anderson Rolled-Tooth Gears

A new machine patented by H. N. Anderson makes possible the forming of gear teeth without cutting them. While the forging is still hot the teeth are formed in it by a rolling process in the machine, thus retaining the natural crust of the metal over the entire casting. The Anderson process covers the manufacture of spur gears, bevel gears, helical gears and herring-bone gears.

Two special-ratio gears for Fords and Chevrolets are being produced by the



The Special Ford-Chevrolet Anderson Gear With a Ratio of 4.2–1

Krom-Nick Gear Co., 1100 Karpen Bldg., Chicago. A low ratio gear is also being made for commercial cars and trucks. This gear has a ratio of 4.2:1. The pinions in the gears are forged from 3½ per cent. nickel steel. The prices range from $1.30 to $12 according to size, type and ratio.

Clark Seat for Motor Trucks

A seat with a cushion pleated and stuffed with moss, for use on trucks, is being offered by the J. L. Clark Mfg. Co., Oshkosh, Wis.

The trimming is imitation leather. The cushion contains 18 springs and is 38 x 17½

Complete Clark Motor Truck Seat, No. 17

in. area and 6 in. thick, with a thick ash frame. The seat is 45 in. wide, 20 in. high and 19 in. deep. The back is stuffed to a thickness of 3 in. and four wrought irons fasten the seat to the body.

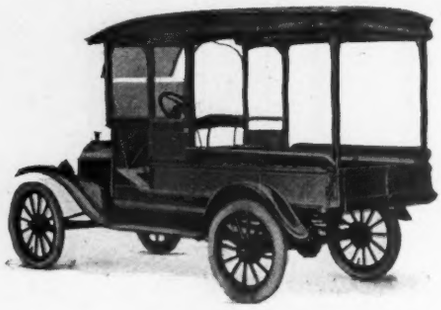
The frame is white ash, of mortised and glued construction and screwed corners. An extra charge is made for painting done to order. The approximate weight of the product, crated, is 100 lb.

Component Parts of Tonford Internal-Gear Drive Unit

New Line of Commercial Car Bodies and Accessories

The Auto Body Works has recently been incorporated at Appleton, Wis., to specialize in a line of commercial bodies for the Ford car. All kinds of auto commercial bodies, truck platforms, cabs and winter tops are also made.

A No. 20 panel body, the sides of which are sheet steel, slatted inside, has a loading space 43 x 62 in. The top is ⅜-in. beaded



The Commercial Body Selling for $42.50

oak ceiling covered with black oiled duck. All necessary irons for attaching to the chassis are included. The price is $62.50.

A platform stake body and cab, catalogued as No. 50, is 5 x 9 ft. It is strongly build for heavy work, having 2x4-in. hardwood sills, 2x8-in. cross beams, 5 ft. long, eight stakes on each side, five in the rear and four at the front.

This body is sold for $87.50 complete. It can be had without the cab if desired. The standard enclosed cab sells for $47.50.

Slip-On Body Used on Ford Roadsters

A slip-on body for use on Ford roadsters sells for $7.75. It has 5-in. white oak flareboards and is 35 in. wide, 54 in. long and 8 in. deep. The spring-catch-drop-end gate is topped with bevel-edge band-iron. The bolts necessary for attaching the body to the Ford car are included. A larger body that is 60 in. long and 10 in. deep sells for $11.70.

A body designed expressly for commercial purposes is offered for $42.50. It is an express body with a top and has curtains and flare-boards. The loading space is 43 x 63 in. The body is braced with irons and the seat is full width with a spring cushion and collapsible back rest. The top is oak with a ⅜-in. beaded ceiling covered

The No. 50 Standard Platform Stake Body

with heavy black oiled duck. It is equipped with curtains that roll up and is painted a dark olive green. Equipment such as rear lamp bracket, toe board irons and irons for attaching to the chassis are included.

Other styles of bodies are also made. An open express body with a cab for Fords, selling for $83, and an open express body for the Ford roadster selling for $35.50 and other minor body accessories are among the line offered by the Auto Body Works.

Overton Ford Truck Unit

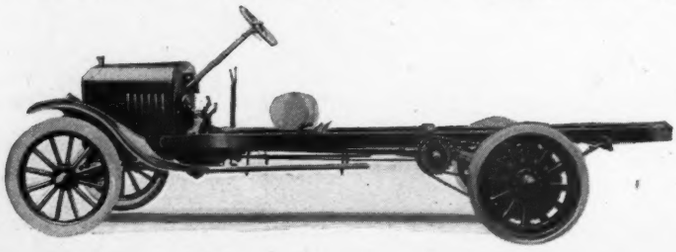
The Overton unit is attached to the Ford chassis by fourteen bolts without drilling any holes in the Ford frame. The frame of the unit is 38 in. wide and when attached, it reinforces and strengthens the Ford frame.

A shallow-bell sprocket is placed over the Ford hub in place of the original wheels. The springs on the attachment are set apart on the axle and close to the wheels, which is claimed to reduce the tendency of the axle to break under heavy loads.

The Overton unit has a capacity of 3000 lb. and a net weight of 1000 lb. The frame is heat treated pressed steel, 4 in. deep. The springs are 2½ in. wide and 40¾ in. apart. The wheels have twelve 1¾-in. square spokes and are equipped with 32 x 3½-in. solid tires. Pneumatic tires can be obtained on special order.

The carbon steel axle is 2 3-16 in. diam. and has Bower roller bearings. The gear reduction is 7:1. There are five brakes—one in the transmission, two on the jackshaft and two on the rear wheels. The chains that transmit the pulling power are 1 in. wide.

The wheelbase is 125 in. and the tread is standard 56 in. The loading space in back of the driver's seat is from 8½ to 10½ ft., depending on the length of the body used. The Overton Truck Co., Detroit, Mich., manufactures this Ford truck unit for $285, f.o.b. factory.



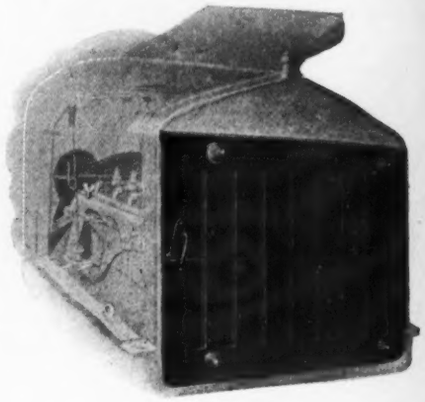
Side View of the Overton Unit, Attached to the Ford Chassis

H-M Metal Radiator Cover

This cover is designed to protect the engine cooling equipment from excessive cold. It is operated with the foot, by a quadrant device extending through the floor board and attached directly to the shifting rod that extends through the radiator to the cover.

The shutter arrangement of moving panels to the cover permits three phases of engine heat control. By completely closing the cover a few minutes before reaching the destination the water is raised to the boiling point, and when the car is left standing the engine heat is said to be maintained several hours by the heat of this water.

The H-M cover is compact and weighs less than 2 lb. It is sheet metal and is



H-M Cover Attached to the Radiator

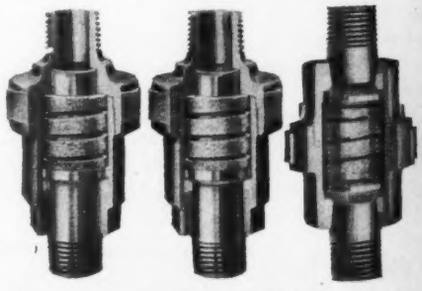
made for any flat-faced type radiator. It is attached by four spring hook bolts that extend through and hook to the cooling flanges on the back of the radiator.

One wing nut and bolt inside the dash permits the removal of the cover without disturbing the quadrant device. The cover is finished in black enamel.

The H-M Metal Radiator Cover Mfg. Co., Indianapolis, Ind., is the maker. The list price of the cover is $5.

No Packing in Swivel Joint

The feature of the Knudsen swivel joint is the elimination of packing and the substitution of a cast iron spring that perma-



Types A, B and C Knudsen Swivel Joints

nently seats the joint and makes repacking unnecessary. This feature also allows the use of permanent iron pipes as conduits in place of more expensive rubber or metallic hose.

The application of Knudsen packless swivel joints is said to be limited only by

the requirement of industries using flexible lines for conducting steam, gas, air or ammonia. A correctly designed installation is guaranteed to stand a pressure of 200 lb.

The cast iron spring has the necessary resiliency to seat the joints and is unaffected by heat and cold. It will last as long as the joints. Three types of joints are made —types A, B and C. Enough metal is eliminated around the swivel end of type B to allow it to move from side to side. Type C has this feature at both ends. With this form of construction, types B and C compensate for any side motion while keeping the line tight.

The Universal Valve Co., Burlington, Wis., produces this joint in sizes ranging from ⅜ in. to 2 in., the prices for which range from $4.50 to $20. This includes all three types.

Star Rubber Tire and Tube

Two new products are being offered by the Star Rubber Co., Akron, O.—the All-Star tire and the Red-Star inner tube. The Star tire is either standard or over-size and is extra heavy to afford increased service. A guarantee accompanies each tire. These tires are made in all standard even sizes from 30 x 3 in. to 38 x 5½ in. at from, $26.20 to $94. Odd or over-size tires run

All-Star Tread on the Star Pneumatic Tire

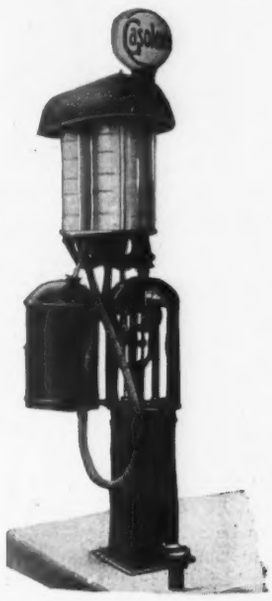
from 31 x 4 in. to 37 x 5½ in. and sell for from $36.10 to $80.50.

The Red Star tube of the Star Rubber Co. is built up of layers of quality rubber all vulcanized into one solid piece. This process and the thick layers produce a thick wall of uniform gage claimed to be free from the possibility of a weak spot. The tubes are packed in water-proof bags placed in attractive boxes.

American Bronze Co., Berwyn, Pa., was succeeded recently by the American Bronze Corporation, which has taken over all assets, patents, trade marks and good will of the old company and assumed all its liabilities.

Visible-Type Gasoline Pump

A new type of visible gasoline pump will shortly be placed on the market by the Indicator Gas Sales Co., Ionia, Mich. Two glass cylinders, graduated to 1-gal. dimensions, provide for a steady flow of liquid. A three-way valve adjusted by a lever permits an intake, when the pump is operated to one cylinder, while the other is being emptied. A second valve insures against the creation of a vacuum in the cylinder as the oil is emptying. Any number of gallons can be secured. The glass containers are protected by a latticed sheet metal cage. It is claimed that no gasoline fumes can



New Visible Gasoline Pump of the Indicator Gas Sales Company, Ionia, Mich.

escape into the air and that there is no chance for waste.

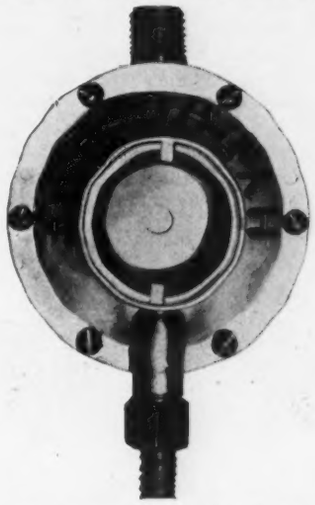
Several of these pumps are now in operation and arrangements for extensive manufacture have been made. The cylinders and valves may be mounted on any present make of pump. The price for this arrangement will be approximately $125. An entire pump, with a rotary suction, will cost about $250.

New Hydro-Eye Attachment Conditions Fuel

A new device made by the Hydro-Eye Co., Inc., 1916 Broadway, New York City, is designed to fit any engine and to economize fuel and decrease carbon deposits. Its principle of operation depends upon the introduction of moist air into the cylinders, producing a better combustion mixture and a more powerful explosion.

A flexible tube carries moist air from the radiator to the device through which it passes into the intake manifold, where it mixes with the fuel. The decomposition of the moist air in the combustion chambers, due to the action of the intense heat in the presence of hot carbon, liberates oxygen, which combines with the carbon to form carbon dioxide and thus burns up the carbon deposit and prevents its reforming. The moist air also causes more gradual expansion of the working gases following the explosion, causing a better sustained rather than so momentarily violent a pressure, which causes the engine to run better.

A diaphragm in the device responds to the suction of the manifold and controls



Hydro-Eye, Showing Glass, Back of Which Diaphragm Operates as Controller

the amount of moisture admitted. The movement of this diaphragm may be seen through the glass eye of the device. The Hydro-Eye will work on any car and is easily attached in a short time. The price including all fittings is $12.50.

New Dawson Grease Cup

The Dawson grease cup is designed to effectively and conveniently provide sufficient lubrication and to prevent cross-threading or leaking. The motion of the car will not loosen the cap on this cup, because it is held by an automatic spring lock. Cross-threading is avoided by having a central post in the lower section of the cup fit

The Dawson Grease Cup, Showing the Inside Parts in Phantom

into a receiving ring in the cover which guides the threading.

Dawson grease cups can be operated easily with one hand in any position on the car without the need of a light. They are refilled without difficulty when necessary. When attached to the car they are permanent and will last during the life of the car without getting out of order.

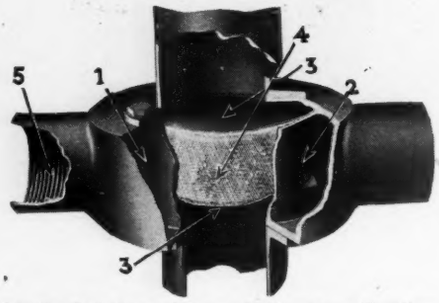
The Dawson Mfg. Co., 4928 Broadway, Chicago, Ill., offers this accessory at a retail price of 60 cents.

Make your product pay—advertise in the CCJ

Thurston Fuel Gasifier

The Thurston device is an attachment said to increase mileage with the use of gasoline or to make possible a greater saving through the use of kerosene or other cheaper fuels. It is made by the Savage Tire Corp., San Diego, Cal.

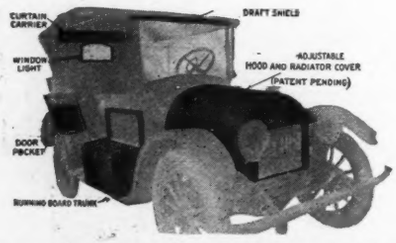
The device is essentially an intermediate passage between the carburetor and the intake manifold. The gas or vapor passes through it and is heated by the hot gas from the exhaust manifold. In the illustration, a flexible tube tapped into the exhaust manifold brings the exhaust gas to the opening at 5, from where it passes through an inner and an outer chamber 1 and 2, and is then carried off by another section of tubing.



Partly Cut-Away View of Thurston Gasifier, Showing Arrangement of Passages

The fuel vapor coming from the carburetor passes through a fine mesh screen 4, which more thoroughly breaks up the molecules and where the vapor is super-heated. From here the mixture passes into the combustion chambers as a more completely vaporized and more explosive mixture. An arrangement is supplied for starting on gasoline, which is controlled from the instrument board.

The price of the Thurston Gasifier ranges from $20 to $30, depending upon the size and type of engine on which the device is to be used.



Simon Adjustable Hood and Radiator Cover

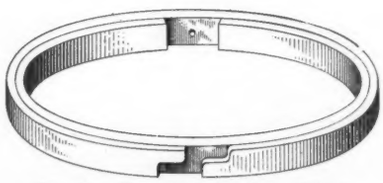
This cover is made to fit the 1917 Ford car exactly, but can also be used on cars with hoods a few inches longer than the Ford hood. The front section of the cover is fastened to the hood for only a short distance across the top from where it is free to follow the lines of the car. Side wings are attached to the blanket so that the front can be pulled together to suit various widths of radiators and still cover the radiator completely. Opening one buckle gives access to the engine under the hood. The illustration shows the cover on a car together with other products of the manfacturers, S. C. Simon & Company, 404-12 Brown Street, Philadelphia, Pa. The hood cover sells from $3 up.

"Swingspout" Oil Measure

An oil can designed to deliver oil to automobiles without the aid of a funnel and without wasting or spilling any oil is being offered by Bradbury & Hoyt, 4715 Hollywood Blvd., Los Angeles, Cal. The device eliminates the need of using an offset funnel in filling a car where the breather-pipes or oil intake are difficult of access.

"Swingspout" Oil Can With Feed Pipe in Vertical Position and Valve Closed

At the bottom of the pipe, shown herewith, is a valve that controls the flow of oil. The pipe is fastened to the bottom of the can and swings from its vertical position in an arc of about 135 deg. When in a position at right angles to the vertical the valve begins to open. In this way the flow of oil can be regulated by moving the pipe within the remaining arc. This is of advantage when filling through the breather pipes where the oil must flow slowly. The price of a ½-gal. can is $1.50.



Stevens Two-Piece Piston Ring

The Stevens Piston Ring Company, Freeport, N. Y., is offering a two-piece piston ring made of high-grade gray iron. It is easily fitted on account of its elasticity. The sizes made run from 2⅜ in. diameter to 7½ in. diameter, and the prices are from $1.10 to $2.50 respectively. An increased price is charged for rings over ⅛ in. width.

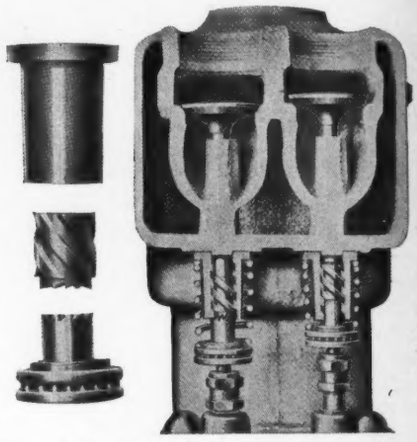
Speco Spark Energizer for Engines

The Speco device produces a more powerful spark in the spark plug by causing the current to jump an auxiliary gap in the device. A gauze covering acts as a screen and also as a condenser. The use of less current and less deposit of carbon are said to result from the use of this accessory. It is sold by the Speco Manufacturing Company, 1777 Broadway, New York City, for $1.

Ceco Engine-Valve Rotator

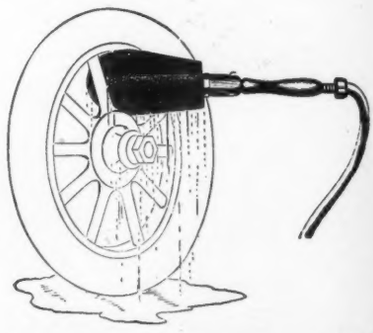
The object of the Ceco valve rotator is to provide a positive rotation of the valve without complicating its operation or increasing the strain on the camshaft. The action of the Ceco causes a positive, partial revolution of the valve on the up-stroke. The return movement reseats the valve in a new position. This continuous operation is said to prevent the forming of carbon deposits, thereby eliminating pitting.

By bringing a different part of the valve head and stem into the path of the flame on each up and down movement, the expansion of the metal is equalized and sticking, warping and distortion is avoided. The operation of the Ceco rotator is said to be noiseless. It is made in sizes to fit the valve assembly of any engine. In attaching to the poppet valve engine there is no need of changing the design of the engine. Where the valve guide is extended, it is cut off and a bronze bushing substituted. There are only three parts comprising the rotator.



Ceco Valve Rotator Unassembled and Section of Engine With Rotators Attached

The Continental Engineering Corp., Omaha, Neb., is the producer of this attachment. Prices can be obtained by addressing the manufacturer.



Autospra Garage Brush for Cleaning

This ingenious device affords a cleaning brush and a spray of water at the same time. It fits a standard hose coupling. The handle is maple and the spray is seamless brass. China bristles are used in the brush and there are no movable parts and no set screws to cause trouble. The long handle gives ample working space and there is nothing exposed that will scratch the car. This device is offered by the Hygenia Brush Company, Worcester, Mass., for $2.50.

The Audit Bureau of Circulations means Circulation Facts—not Unverified Claims.

Detlaff Friction Clutch

The Detlaff clutch carries one driving and one driven member, the former being secured inside the flywheel, or other retaining member, by three hardened steel pins, and the latter splined to the drive shaft. The splined construction on the shaft permits the removal of the shaft from the clutch units without detaching the clutch from the retaining member.

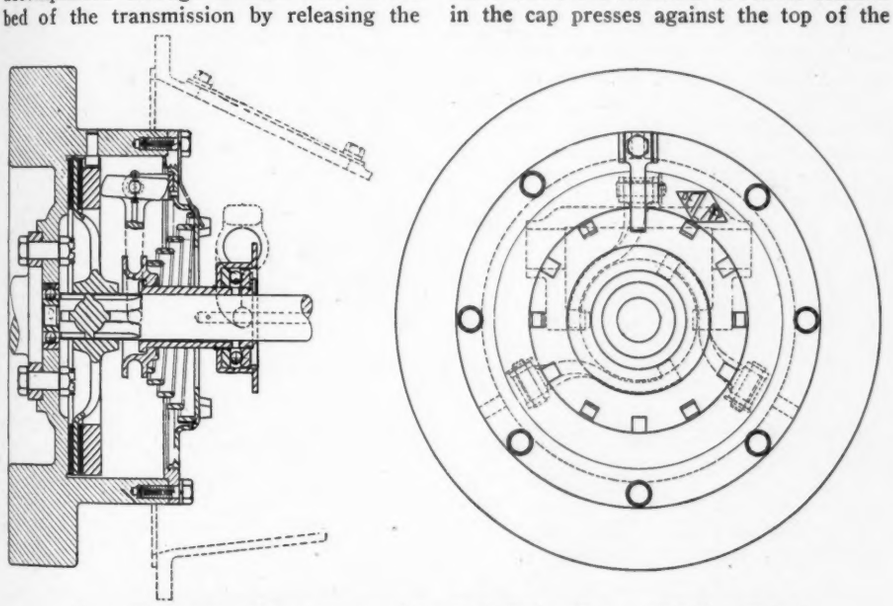
The drive from the motor to the shaft is through three double-headed cams that furnish a lock between the front adjusting plate and the driven member. The heat of friction, produced while the load is being picked up, is absorbed by two friction matts on either side of the driven member. When the double-headed cam is thrown into position by releasing the clutch pedal, the load on the locating pins and the retainer is taken care of by the linkage effect produced between the rear seat and the driving member. Wear on the friction matts is taken up by a thread arrangement that carries the cams and permits of the bringing of the two cam seats together.

Adjustment is made by raising the locking spring and turning the front plate to the right through 60 deg. and then relocking it. When the clutch is used as a unit with the transmission, the adjustment is accomplished through a hand hole in the bed of the transmission by releasing the clutch, raising the spring and turning the front plate as explained.

The springs actuating the cams are of suitable tension to permit easy foot action and to provide an effective lock between the two seats. The multiplied leverage on the arms of the cams and the easy spring action are claimed to pick up the load without shock, and the shape of the cam head is said to insure release with a minimum travel of the foot pedal. The linking effect produced by the double-headed cams in the Detlaff clutch makes a lock, when the clutch is engaged, that is said to effectively prevent slipping.

The claims of simplicity, accessibility and flexibility and the transmission of the power of the engine to which it is applied without slip or loss make the Detlaff clutch effective on passenger cars, trucks and tractors.

A. J. Detlaff, 121-29 Lafayette Ave., Detroit, Mich., is the manufacturer of this attachment.



Cross-Sectional and Face Views of the Detlaff New Type of Friction Clutch

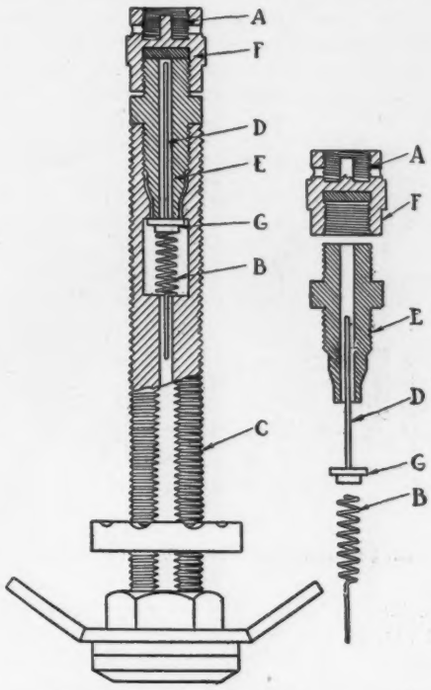
New Tire Valve Invented

Sidney C. Sladden, 233 Broadway, New York City, has been granted a patent on a new pneumatic-tire-tube valve. Several new principles are embodied in this valve. Instead of using the usual conical friction stop gap to prevent air leakage, a rubber washer is forced against the air inlet by the pressure of the air in the tube.

The complete valve includes a hollow stem in which is an internal chamber; a removable hollow-centered plug mounted in the stem and extending into the chamber; a closure valve that sets across the central passage of the plug and has an annular flexible flange extending across the joint between the plug and the stem. A cap screws over the top and can be inverted so that a post in its center presses the plunger down and allows the air to escape through port holes in the side of the cap.

The spring in the chamber has an extension running down into the stem that keeps it in a vertical position. Ample space is allowed for the passage of air around the valve when it is released. A rubber cushion in the cap presses against the top of the plug and securely seals the valve against leakage.

An advantage in this type of valve is the elimination of delicate adjustments and small parts that get out of order. The entire valve is easily and quickly assembled and remains serviceable while used. The Sladden valve head contains a screw thread permitting the Sladden plunger to be interchanged with the conical type.



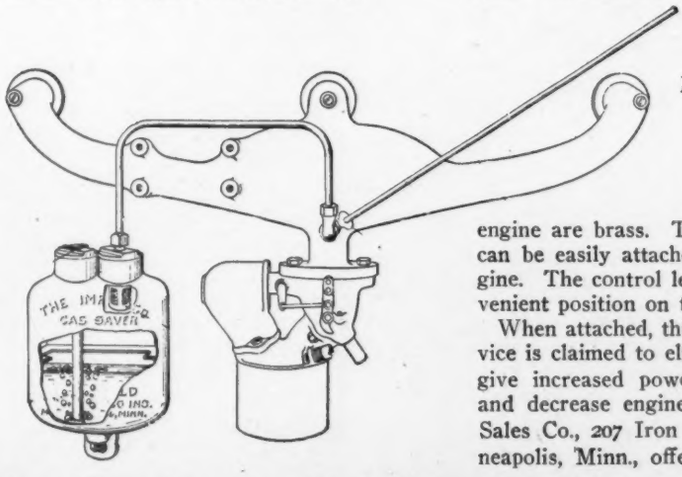
Sladden Valve for Pneumatic Tires

"Improved" Gasoline Saver

The Improved Gas Saver is made of aluminum and brass except the back strap that connects the device to the engine. The water container is an aluminum casting. Inside are baffle walls that lessen the violent splashing of the water. At the inlet there is a pipe leading to the bottom of the container. Through this pipe the air is carried to the bottom, from where it bubbles up through the water. In this way moisture is picked up by the air.

At the outlet a strainer prevents dust and other foreign matter from entering the engine. All connections from the outlet to the engine are brass. The "Improved" device can be easily attached to any gasoline engine. The control lever is placed in a convenient position on the dash.

When attached, this fuel conditioning device is claimed to eliminate carbon deposit, give increased power, economize gasoline and decrease engine trouble. The World Sales Co., 207 Iron Exchange Bldg., Minneapolis, Minn., offers the device for $10.

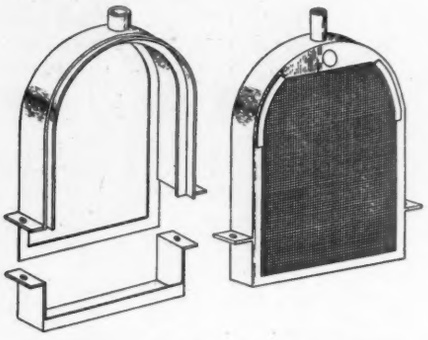


Method of Attaching the "Improved" Gas Saver

New Penhallegon Radiator

The Penhallegon radiator is demountable. This feature is said to give the attachment longer life and to save time and trouble. It is suitable for use on any passenger car or truck.

The lower part of the shell is a separate piece of metal claimed to have sufficient strength to meet the demands of whatever model car the radiator is applied to. It is designed to minimize wear and tear on the core. Adjustment to the frame of the automobile is obtained through a patented double bolt of two diameters. This bolt is held in place with a nut and lock washer.

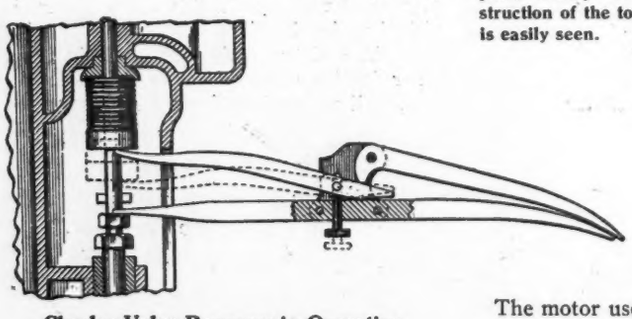


An Unassembled Penhallegon Radiator

The core is easily attached, a "lip" on each side fitting between the connections of the shell and being fastened by the double bolt. The top part of the shell can be adjusted at any time and is fitted with a standing tubular neck designed to insure rigidity and protect the finish in removing. The manufacturer is the Penhallegon Co., St. Paul, Minn.

Charles Valve Remover

The Charles tool for removing valves is 11 in. long and weighs 1 lb. It is carbon steel and is operated by a cam motion. A set screw is provided for adjusting the center or fulcrum to any position for various lifting heights. There are no springs or ratchets to wear or complicate the operation.



Charles Valve Remover in Operation

The tool will lock at any height and support the valve spring until its replacement is desired. The cam principle together with the lever operation makes the Charles valve tool easily worked and simple in construction. It is being produced by the Charles Valve Remover Co., Middlefield, O.

Crowe Mechanical Fan Belt

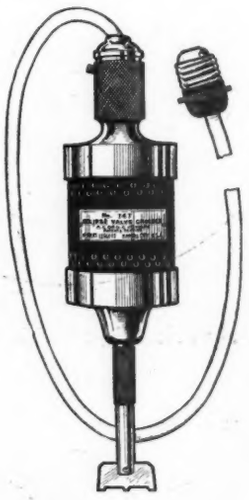
The Crowe mechanical fan belt is a product of the Mechanical Belt Co., 1202 Frederick Ave., St. Joseph, Mo. The chain is a steel framework of flexible links into which blocks of sole-leather are set. This construction gives a strong and effective belt. The blocks are concave to make the operation of the belt noiseless. One feature is the ease with which the belt can be lengthened or shortened. By simply sliding out any leather section the chain opens, and closes upon replacing the leather block.

Construction of the Crowe Fan Belt

The traction provided by the leather blocks, together with the caterpillar tread principle, makes the belt cling to the pulleys even when they are oily and slippery. The belt is not affected by oil, heat, dirt or water and is made in all lengths for different cars. The 1917 Ford belt sells for $1.10. It is 27 in.

Eclipse Engine-Valve Grinder

An electrically operated valve grinding tool is being offered by the Eclipse Valve Grinder Sales Co., 116 W. 39th St., New York City. A vertical handle with a plunger switch affords effective control and the weight of the device is proportioned to secure the proper pressure. A ballastic movement produces a finish said to be free from scratches, grooves or other evidence of defective workmanship.



Eclipse Valve Grinder Complete

The small, compact, sturdy construction of the tool is easily seen.

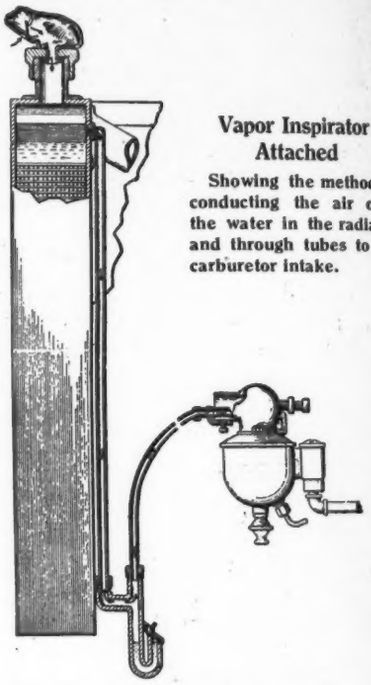
The motor used with the machine is small and sturdy and operates on either direct or alternating current. The top bearing has a felt oiling device that supplies sufficient lubrication.

Complete instructions, seven detachable bits, a lifting spring and 7 ft. of extension cord with a swivel plug accompany each machine. The tool is guaranteed to remain effective for one year. It is manufactured by the Eclipse Valve Grinder Co., Kansas City, Mo.

Vapor Inspirator Attachment

The Vapor Inspirator is a device that draws air in at the radiator cap through a frog-shaped inlet attachment, carries it over the water in the radiator where it draws up moisture, conducts the moisture-laden air down through a tube that hangs parallel to the inner wall of the radiator to an arrangement at the bottom where the surplus moisture is condensed. From here the air is led through a tube to the air intake of the carburetor.

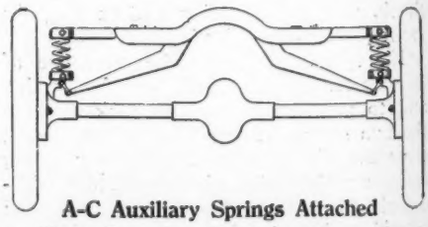
The frog is brass, painted green. A stem from it passes through a hole made in the radiator cap, to which it is fastened by a lock nut and washer. The remaining parts of the attachment include a metal trap attached to the overflow pipe and by a bypass connected to the trap by a rubber-lined, flexible aluminum tube.



Vapor Inspirator Attached

Showing the method of conducting the air over the water in the radiator and through tubes to the carburetor intake.

An increased mileage per gallon of gasoline of at least 20 per cent. is guaranteed by the maker. The retail price of the attachment is $6.50. The Vapor Inspirator Co., Inc., 1225 W. Tenth St., Kansas City, Mo., is the manufacturer. H & H Motor Specialties, Inc., 755 Boylston St., Boston, Mass., distributes the device in New England territory.



A-C Auxiliary Springs Attached

Herewith are shown the A-C auxiliary springs attached. They increase the carrying capacity of the Ford car and tend to prevent the swinging and tipping of the body from side to side on rough roads. An increased tire mileage is also claimed because the A-C springs sustain the road shocks that the tire would have to stand. These springs are being offered for $15 by the A-C Manufacturing Company, 2047 West Chicago Avenue, Chicago, Ill. They can be attached in thirty minutes without drilling any holes.

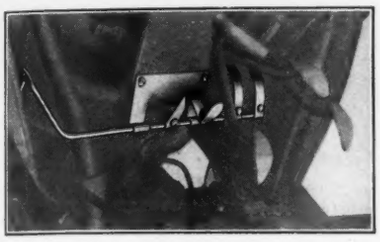
Advertising appropriations bring greatest returns when expended in the CCJ

Speederator for Ford Cars

The Speederator has recently been added to the Ford accessory market by the Detroit Starter Co., Detroit, Mich. It gives the Ford car increased flexibility in engine operation without unnecessarily complicating the working mechanism. It is offered at the nominal price of $2.85 f.o.b. Detroit.

The Detroit Starter Co. advances the following claims for the device:

It eliminates the necessity of operating the steering post throttle by hand, the speed changing levers doing all the work. It automatically idles the engine in changing speed. The engine speed in starting and reversing is proportional to the pressure exerted on the low and reverse speed pedals. The engine will not stall and its speed is automatically increased when necessary, so that wear on the brake clutch bands is lessened. A saving in gasoline consumption is effected by idling the engine during speed changing. The beginner is enabled to control the car more quickly and smoothly and to learn to drive it in a shorter time.



Position Occupied by the Speederator Control When Attached to Car

The device is easily attached over the gear box plate with two screws. A foot-throttle is provided to take the place of the throttle on the steering post. Full directions for attaching accompany each device.

Stanwal Woven Brake Lining

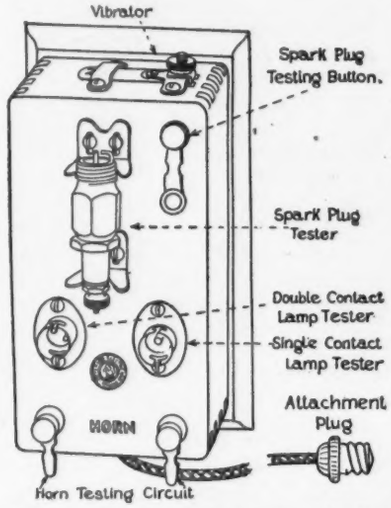
The Standard Woven Fabric Co., Walpole, Mass., is introducing a new product known as Stanwal brake-lining. It is a specially constructed fabric claimed to be heat resisting and impervious to oil, grease, gasoline, water and dirt. The base of Stanwal is woven brass wire covered and protected by a heat-proof fibre. This fibre is worked and treated to produce the necessary cohesive and frictional qualities when in contact under pressure with the brake drums. The lining does not scratch the brake drums and operates practically noiselessly.

Stanwal lining does not swell or bind and is unaffected by the heat generated in the brakes. Its base is a special heat-proof yarn that is carded and twisted to obtain greater tensile strength. The yarn is later interwound with brass wires. By compressing the lining under heavy steel rollers, added solidity and a smooth, even contact surface are obtained.

A special brake lining for Fords is supplied in cartons. The length is 23½ in. and three strips are required. All necessary rivets for applying are included. When desired, full rolls of 100 ft. can be had. Prices quoted by the maker upon request.

Combination Tester is Useful

The Jefferson combination tester is an outfit that will test all automobile lamps of any candlepower or voltage, spark plugs of all sizes, electric horns and signals, and any electric device of low voltage. The tester is designed for connection with the lighting circuit of the building and is furnished in forms for either direct or alternating current and for the common voltages and frequencies. Where lighting current is not available a tester is supplied suitable for use with a 6-volt storage battery or four dry cells.



Jefferson Electrical Tester Combination

The illustration shows the main features of the No. 17 model. This tester is furnished with 7 ft. of portable cord and an attachment plug. In ordering it should be specified whether an alternating current or battery connection is desired. The Jefferson Electric Mfg. Co., 426-30 S. Green Street, Chicago, Ill., is the maker. Model No. 17 sells for $8.

Stock and Tire Display Rack

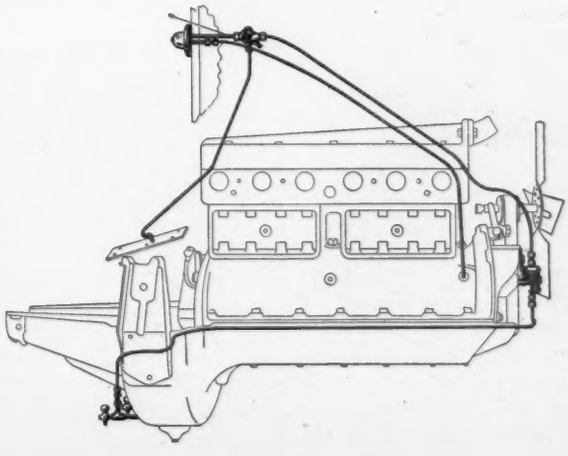
A tire rack, built for stock and display purposes, is being manufactured and offered to the automobile trade by the Dow Wire and Iron Works, Louisville, Ky. It is a double-deck rack, 6 ft. 3 in. long and will carry any size tire. Finished in black enamel, it is sold for $5.50.

The Forgear Oiler for Fords

By means of a gear pump in this lubricating device the oil is circulated in a steady stream from the transmission case bottom through a sight-feed on the dash to the front of the engine and return.

As the speed of the engine increases, the circulation of the oil becomes more rapid. The oil is cooled to its proper consistency by passing through copper tubing on the outside of the engine. A valve controlling the flow of oil is provided.

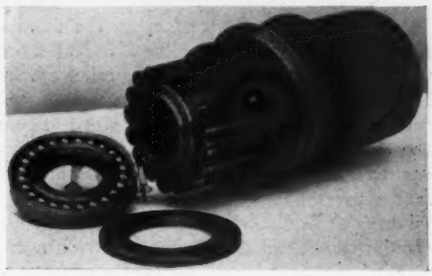
This system is claimed to prevent scored cylinders, leaky pistons and burnt-out connecting-rod and crankshaft bearings. It is a product of the Forgear Pump Company, 523 Hobart Street, Oakland, Cal., and sells for $12.50.



Planetary Roller Bearing

A roller bearing that is said to be frictionless and to require no lubrication is made by the Planetary Roller Bearing Co., 342 Monadnock Block, Chicago, Ill. This bearing is suitable for automobiles, trucks trailers, tractors, shafts, etc.

Babbitt-metal boxes and composition journals are eliminated and the personal danger and possibility of soiling various materials, through the use of oil and grease in lubricating, are eliminated. Fire hazard is also reduced.



The New Planetary Roller Bearing

This roller bearing is durably constructed and is claimed to have no part that will break or give way under any load or speed.

Instant Tire Puncture Cure

Instant Puncture Cure is a compound for healing and preventing punctures and porousness. By strengthening the tube it also tends to prevent blow-outs. It is said not to injure the tubes or casings nor injure or clog the valve. Its operation is not affected by heat or cold. With it vulcanizing is claimed to be more easily done and it also prevents tires from becoming overheated in hot weather.

This compound is put up in friction-top cans and graduated to the proper amount for one tire. Twelve cans are packed in a case, each can being marketed for its special size tire. The cost is $1 per inch for the cross-sectional diameter of the tire, thus: 2½ in. tire, $2.50; 3 in. tire, $3, etc.

THE WHITE MOTOR CO., Cleveland, Ohio, is erecting a 2-story addition, 125 x 500 ft., which will cost $300,000. It will be of concrete and steel construction.

Interesting and helpful information; reputable advertisements—that's the CCJ

Use of Motor Trucks by United States Reclamation Service

By H. H. HARWOOD

TEN years ago the U. S. Government, through the Department of the Interior, started an investigation with reference to irrigating part of the territory of the Northwest. One of the localities investigated was the territory about 47 miles from North Yakima, Wash. January 1, 1917, the results of this investigation were made known and work was started on what promises to be the biggest reclamation project ever undertaken by the Government.

North Yakima, Wash., a city of 20,000 population, lies in the center of a rich agricultural district; fruit, hay, grain and potatoes are fast putting the population of the contiguous territory in the leisure class. There remains, however, in Yakima County, a vast area which is unproductive owing to the fact that little or no rain falls during the summer, and as a result of the lack of moisture, crops cannot be grown. With this knowledge the Government, as well as private individuals, dammed up several rivers and diverted the water into irrigation ditches.

One of the greatest of these projects is the one the Government is now undertaking at Rimrock, Wash. Rimrock lies about 27 miles from Natches City, which is in turn about 20 miles from North Yakima. Before January 1 all there was at Rimrock was a huge canyon through which the Tieton River flowed and some virgin timber bounded on all sides by mountains. Since then the Government road has been constructed to Natches City, a distance of 27 miles through the mountains and timber, and motor trucks are hauling supplies over that road today.

The Tieton River, which flows down the canyon between the mountains, will be dammed to form a vast reservoir. The dam will be 200 ft. high, 1000 ft. long and will impound 185,000 acre feet. Four years will be required to build it, but no work will be done on it this season. First there must be a tunnel run through the mountain from the reservoir to the bed of the river further down to divert all the water from the river during the construction of the dam, and later to be used for supplying irrigation water. The tunnel will be about 1500 ft. long through what is known as Westfall Rock.

At present there are 420 men working at the camp and their supplies must be hauled by team or motor truck. Teams were used for a short time, after which the U. S. Reclamation Service invested in five 3½-ton trucks, which today are hauling the supplies every day from Natches City to Rimrock.

The cost of operation furnishes an interesting example of the saving made possible by motor trucks on a long haul. Each 3½-ton truck, with a capacity load, makes one round trip a day over the mountain road. The return trip for the entire distance is up a grade running from three to ten per cent. The roads, having been constructed last January, are now in far from satisfactory condition, and a high-priced touring car recently was unable to negotiate the roads over which the trucks are running every day. Figures compiled by C. E. Crownover, project manager, show that the cost per ton-mile for transporting their supplies by teams was 30 cents, and that the cost per ton-mile for transporting by motor trucks was 19 cents, showing a saving of 11 cents per ton-mile. This, according to Mr. Crownover, in the short time the trucks have been in operation, has saved the Government enough to pay for the initial cost of the truck. It would take a four-horse team three days to make the round trip under the present conditions. It has been estimated by Government officials that over 50,000 acres will be directly benefited by this irrigation project.

Truck Used by United States Reclamation Service in Hauling Supplies to Rimrock, Wash.

Five of these three and a half ton trucks each make one trip a day over twenty-seven miles of mountain roads, to Natches City and return. Load shown is 9200 lb. of electric ranges, used at the camp.

Motor Plowing in Scotland

By Consul Rufus Fleming, Edinburgh

The Board of Agriculture for Scotland has invited the Highland and Agricultural Society to organize demonstrations of farm tractors and plows, to take place early in the fall. The society has accepted the proposal, and the demonstrations will be held about the middle of October. Fifteen types of motor tractors have been used during the last 12 months. Of this number 10 are of American design and manufacture. In regard to the results obtained by motor plowing a member of the Board of Agriculture recently said:

The varying conditions under which they were worked did not permit a comparison of costs, but one or two typical sets of figures showed that under moderately favorable circumstances the cost of plowing ran from 20 to 25 shillings (from $4.85 to $6.10) per acre. Estimated allowance for depreciation added 5 to 7 shillings ($1.20 to $1.70) to these sums. By means of the tractors a considerable amount of fairly satisfactory work was accomplished, but reports seemed to show that tractors could not yet be depended on for efficiency, reliability and general usefulness under Scottish conditions.

Various defects were noted, among the most common being inability to bear or evade sudden abnormal strain without risk of serious breakage, absence of springs, tendency to slip on wet or sandy soil, insufficient power, unsuitability for haulage on roads, complexity, imperfect automatic lubrication and weakness of construction, tending to lack of durability.

The acreage of arable land in Scotland is now 3,289,902. An official order with reference to the acreage of grassland which should be plowed up for the harvest of 1918 provides for the cultivation of 366,650 additional acres. To accomplish this work in the plowing season, which begins in October next, will necessitate the employment of all available mechanical aids, and there is of course a demand for the most suitable tractors and plows. The coming demonstrations, promoted by the Board of Agriculture, should afford an excellent opportunity for American manufacturers to show the merits of their machines for tillage in this country.

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

THE giants of industry are coming to depend more and more on Firestone Giant Truck Tires for their heavy hauling.

With this massive single tread absorbing the strains and shocks at all times, regardless of irregularities in the road, new and higher degrees of truck efficiency are being obtained.

More rubber, more resiliency, more traction, less fuel, grooves or flutes prevent skidding, greater efficiency, Most Miles per Dollar.

Call in a Firestone man. He will tell you of this new tire and all our other types, one for every road, load and condition of service.

FIRESTONE TIRE & RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

Four-Wheeled Ambulance for Motor Cars

NECESSITY is said to be the mother of invention, and the necessity for some sort of a device for quickly and safely handling crippled automobiles that had met with an accident and could not be brought into the garage on their own wheels, prompted the managers of Youngs & Co. to devise something that would fill this long felt want.

The picture of the completed device is herewith shown. It consists of two iron armored rails, a front and rear axle and four rubber-tired truck wheels. The front end of the frame is supplied with a windlass of the ordinary back-geared type, known as the "twenty-ton" windlass. The front of the machine is provided with a detachable draw bar, the rear end of which is connected with the steering wheels to a suitable mechanism, so that the wheels will turn with the draw bar. The machine, when being used as a trailer, will follow almost in the tread of the car or truck which is towing the machine.

When supplied with its full equipment of accessories, it will have a shovel, a pick, an axe, two crow bars, steel cable, a snatch block, a saw, suitable blocking, a powerful jack, a block and fall of good capacity, and such other rope and sling as the occasion would require.

The method of operation, if the disabled car should be right side up on the road, is to back the trailer up to the disabled car and remove the rear wheels and apply the winch to the disabled car and pull the same up on the frame of the trailer, after which the frame is jacked up and the rear wheels attached. It is then hooked on behind a truck or touring car and can move along at regular motor truck speed without injury to itself or to the load it may be carrying.

It is large enough, to take within its own wheelbase, the largest size automobile made or a motor truck. If the disabled car should be down a bank, but on its own wheels, although some of the wheels may be broken, the trailer is allowed to roll down the hill backwards, and the same procedure follows as on the other, except that after the disabled car is made fast to the frame and the wheels applied to the rear of the trailer, the rope from the windlass is made fast to the opposite side of the road and the trailer and disabled car are drawn up on the road.

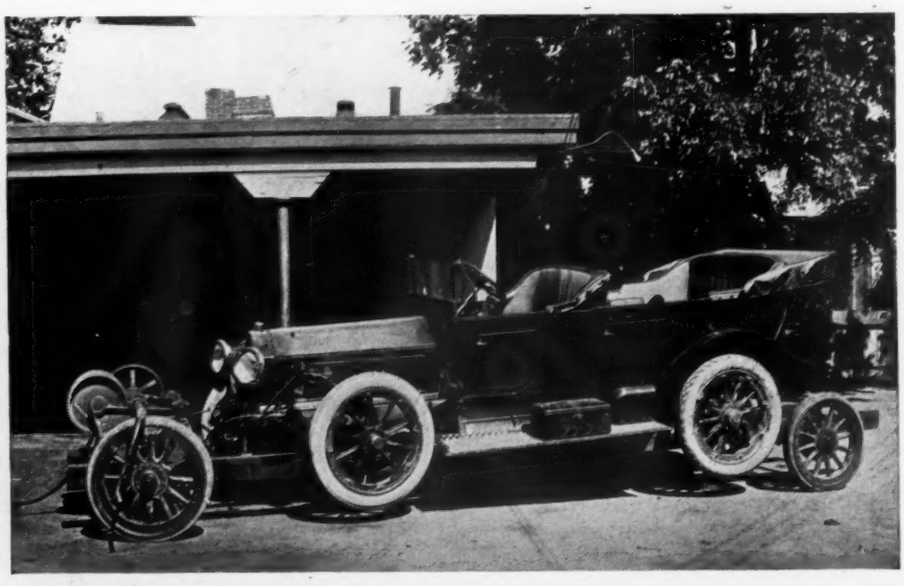
If the disabled car should be on its side or upside down, or in this condition down a bank or submerged in water, the trailer is so arranged that by ropes arranged in a suitable manner, it is possible to raise it by its own windlass so that it will stand on the end of its frame, this serving as shear poles as shown in the second illustration. So far as is known, this is the first device of this kind to be used in the automobile business as a trailer and convertible shear poles.

Heretofore the towing trucks in use had small iron wheels that made it necessary to proceed at a very slow rate of speed over rough places in the road, and a great jar was produced to the damaged car. With this improved wrecking truck, or motor ambulance, as it may rightly be called, it is possible to arrive quickly at the scene of trouble and remove the wrecked car in the shortest space of time possible and return to the garage with perfect safety and at a fair rate of speed.

Youngs & Co., of Newburgh, N. Y., are responsible for the production of this machine and for 12 years they have conducted a garage in Newburgh, N. Y., which has always been known to be up-to-date with its repairing facilities, and the addition of this new motor ambulance is another proof that they are keeping abreast with the times and living up to their reputation.

Ambulance on End

By ropes arranged suitably, it is possible to raise this ambulance by its own windlass so that it will stand on the end of its frame. this serving as shear poles.



This Illustration Shows That the Ambulance is Long Enough to Handle Any Car or Truck

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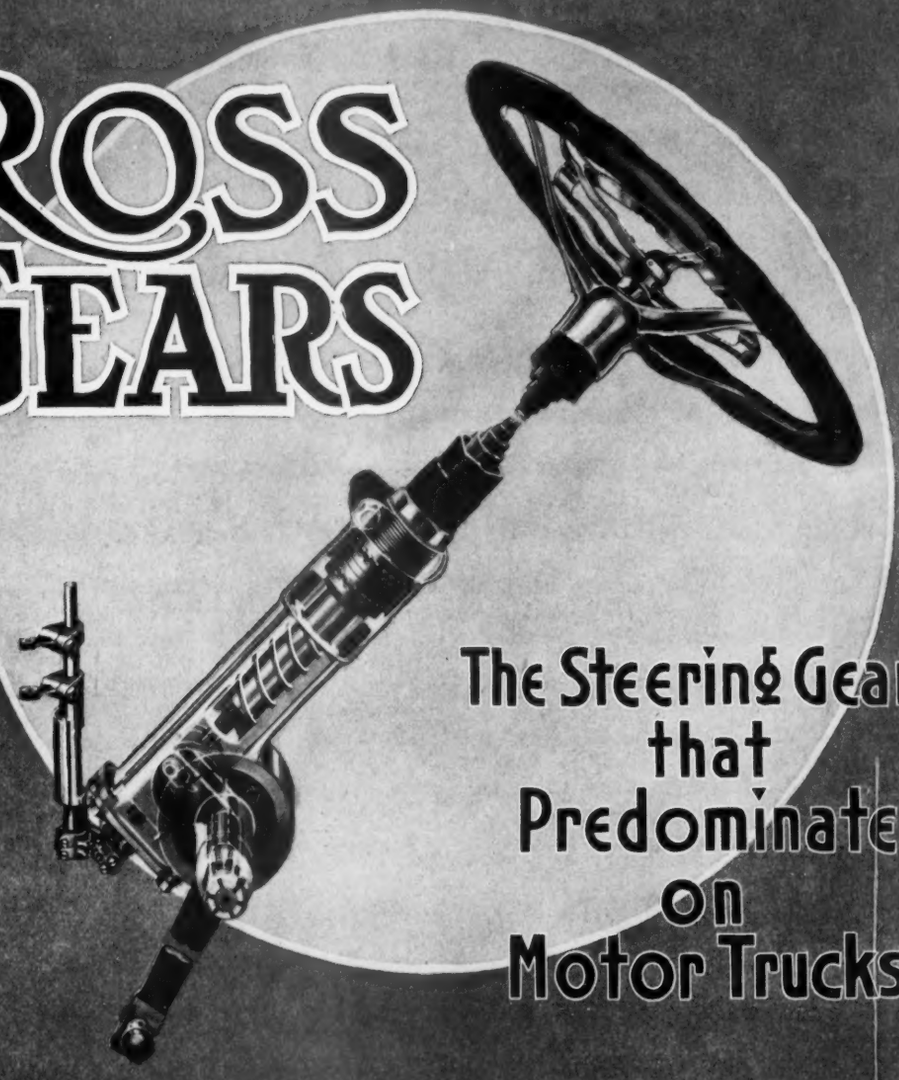
THE CITY OF PARIS has purchased 200 motor trucks, 100 being 5-ton Pierce-Arrows and 100 3½-ton Fiat machines. These trucks are to be used for the distribution of food and coal during the coming winter, and it is expected that delivery will be greatly facilitated and that conditions such as existed last year, when the city was forced to borrow machines from the army, will be prevented. Paris and the Seine department will have 1,300,000 tons of coal for distribution during the coming season, in addition to large quantities of foodstuffs.

Everybody who is anybody in the truck industry reads the CCJ

ROSS GEARS



The Steering Gears that Predominate on Motor Trucks

The Ross-Steered Truck

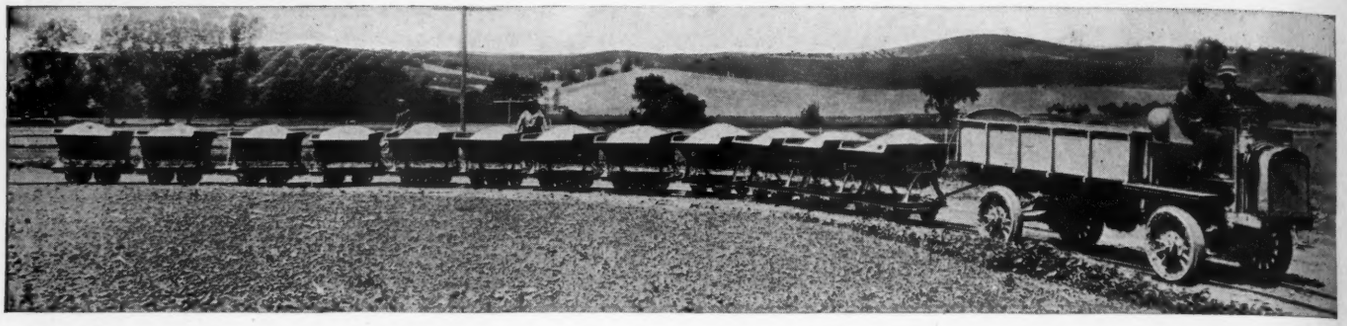
A Ross Steering Gear is practically conclusive proof of the merit of a motor truck, as it is reasonable to believe that the manufacturer, who has placed quality before price in the selection of the steering gear, has given the same careful consideration to the entire construction of the truck.

One hundred and fifteen motor truck manufacturers, representing considerably over half of the entire industry, are now giving to their customers the added assurance of safety, reliability and easy steering which Ross Gears guarantee.

Upon request we will be pleased to send our catalog and any special information desired

Ross Gear & Tool Company
760 Heath Street Lafayette, Indiana

"The Great Business of the Country Today is War. Upon the Things Which Alone Can Assure Its Success Must the Whole Force of the Country be Centered!"



How Roadmakers Can Help Win the War*

By H. E. HOPKINS

NO one thing is delaying the progress of the American nation in its preparation for war as is the failure of the majority of our people to realize that we are at war. It would seem that the war must be brought to our very doorsteps before we do.

Our unlimited wealth, our almost inconceivable resources, will not win it. Wealth alone is a drawback, for victory will neither feed nor clothe the nation nor cannot be bought. Undeveloped resources aid those to whom we owe succor in the European battlefields and in the devastated homes. Means in themselves are futile without the ways to use them to greatest advantage.

Let us get down to brass tacks.

Our country demands men and ways for transportation!

Altogether, the railroads operate 2,000,000 freight cars; they own thousands and seat. Almost half of the 110 makers in connecting our principal centers of manufacture and food supply. But they never will have enough cars or sufficient network of trackage to reach all our sources of supply—in other words, the railroad can never become an adequate commercial highway. This is the province of our road systems—when we get them.

Sixty cantonments are in process of completion throughout the country for the training of our citizen troops, situated necessarily where they are best suited as to area, climate and accessibility—and nearly every cantonment has suffered more or less delay because of its lack of approach—the hard road.

Six of our largest motor truck manufacturers have guaranteed to supply the government at the earliest possible time with millions of dollars' worth of their products for the nation's service. The Four-Wheel-Drive Co. has a contract involving the expenditure of $12,180,000; the Nash Motors Co., making the Jeffery type, will deliver 3000 trucks by July of next year; the Garford Motor Truck Co., 900 trucks; the Locomobile Co. (the Riker type), 125 a month, or 400 in all; the Packard Motor Car Co., 1500 trucks; the Duplex Truck Co. has a large number of trucks already in the government service—and this list is a long way from being complete. It is thus evident that the truck manufacturers are doing their part in "speeding up."

No one can conceive of the possibilities of the pleasure car as a means for transporting troops and supplies—if roads are provided on which they can travel. As an earnest of what can be done with the pleasure cars and motor buses, France commandeered 80,000 of them at the war's commencement and transported 200,000 men to the front—on good roads.

Out of what is more or less derisively denominated our two million miles of "road," we have built—what? A little less than 10 per cent.! These are not statistics of which to be proud.

But we cannot get the labor, you may argue. You may ask: Why have our men been taken from us to do service in the fields of war and in other industries than ours, leaving us without proper facilities?

The question can best be answered by asking others.

What is being done throughout the highway industry today to release man-power by the mechanical means at our very elbows? We have made a beginning, of course.

How many farmers are utilizing the tractor in lieu of man labor? Some of them are so doing.

How many factories and other producing establishments are almost criminally denying the government the voluntary services of our young manhood by sticking to expensive man-power when the mechanical ways are at hand to perform the work to their satisfaction and profit? The majority of them are neglecting these means.

Consider in our own particular field of endeavor, what a waste of human skill is daily being expended on our roads and

*Reprinted from *Road-Maker* for September, 1917.

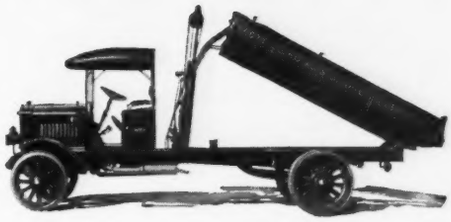
Under the Old Way of Delivering Road Material, How Many Men and Horses Would be Needed to do This Work?

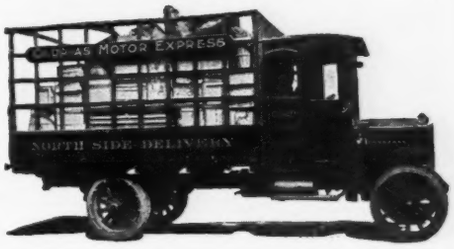
The Tools of War

IT was demonstrated at the Marne—the most important battle of all the ages—that there is no more important *tool of war* than the motor truck. It was the motor truck that *saved Paris.*

The prominence of Velie Trucks in every department of the army in which trucks are used—in the construction of cantonments, in the hauling of men, munitions, supplies and materials, is due to those same attributes which have made it such a big factor in every branch of commerce—ample power for every emergency, dependability, low upkeep and operation cost, freedom from need of repairs.

Here are the *"reason why"* specifications: Heavy-duty Continental motor, worm gear drive, Timken bearings throughout, steel Raybestos disc clutch, nickel chrome and vanadium steel construction.





VELIE MOTORS CORPORATION
119 Velie Place Moline, Illinois
Builders of Automobiles, Motor Trucks and Tractors

1½-2-Ton Capacity, $2750
3½-4-Ton Capacity, $3600

You should know of the satisfaction and service Velie trucks are giving.

Write today for booklets and complete particulars.

Velie Trucks WORM GEAR DRIVE

highways. In no other industry are there more ways for releasing our laborers than on the highways. We must study this labor problem as never before—justly and even mercilessly.

Why, in Mexico—that land of chaotic political conditions and disregard for human life—the astute Carranza is building a 120-mile highway, full of engineering difficulties, in Lower California. But he is using every mechanical means—such as motor trucks, excavators, steam plows, graders, explosives and the like—all conserving time and labor.

Ever watch a gang of men on a road job listlessly hacking at a forest of trees, or picking and shoveling away at a rocky hill—when a few sticks of explosive well placed would accomplish in a few minutes what it took the men days to do?

Here is a gang of men digging a trench, piling up the earth on the road alongside—and a mechanical trench-digger would do twice as much in a twentieth of the time.

Recently we saw a five-ton motor truck hauling broken stone for a macadam road. It traveled eighty miles in a working day and placed some sixty tons of material. One man—the driver—did all the manual work! What a difference perhaps in the way you are hauling and placing material.

Still another instance: Twelve men picked and shoveled and loaded wagons on a road that had to be dug a foat deep; the yardage in an eight-hour day was about 64 yards. On a similar job, not a mile away, an excavator was used with a skimmer scoop in the boom. Four men and a fireman made up the crew. They removed 110 cubic yards in an eight-hour day—twice the amount of work done and at one-half the labor expense and waste.

In a concrete construction job of any size there are usually hopper cars delivering the batches to the mixers at the stock bins; motor trucks to haul a four-yard load in each of the seven or eight hourly trips. There are a dozen ways in which labor may be saved on this kind of work.

The market is replete with practical devices for conserving labor. Machinery has always dispensed with both men and beast, though some severe criticism has been directed against the average road builder for his apparent reluctance to adopt the more skilled and economical way—the mechanical way.

But why further enumerate?

Machines Should Replace Men

Let us throw into the discard the moss-back saying that "if we had back them good ol' days and the boys behind the pick and shovel, how much we could do!" Our country can put its man-power to far better uses, even in peaceful times. But now we need all our able-bodied men for defense and to help the world in its struggle for liberty and progress.

Neither have certain of the highway engineers wholly escaped well-merited criticism. The highway engineer's training makes him culpable where the latest methods for handling his work are not employed. He should at all times be a builder as well as a "layer-out," a business man, a student of economy and a getter of results. Many highway engineers have these qualifications; unfortunately more are either ignoring them or are deficient in training.

Nothing but praise can be paid to the majority of the manufacturers of road-building machinery. They have spent years of study and employed the highest engineering skill to reach their present development—and they have made their products widely known. In fact, it is hardly to our credit that foreign countries have apparently been quicker to adopt our road-making machines than the United States.

And so this condition brings us back to the beginning of this article: We do not realize our unpreparedness for war, and because war has not descended upon us as it has upon the peoples of Europe, it may come to pass that our neglect to use all the means at hand to develop our business will bring bloodshed and woe to our shores—which God forbid!

It is being strongly borne upon us, however, by the administration, the national boards, the army and navy officials, the leaders of our giant industries and our thinkers and doers, that war today is our principal business, and therefore every industry upon which the necessities of war depend must be protected, developed and brought to its highest efficiency.

The industry of the roads is one of the greatest of these.

Making a Portable Machine Shop From an Old Jitney 'Bus

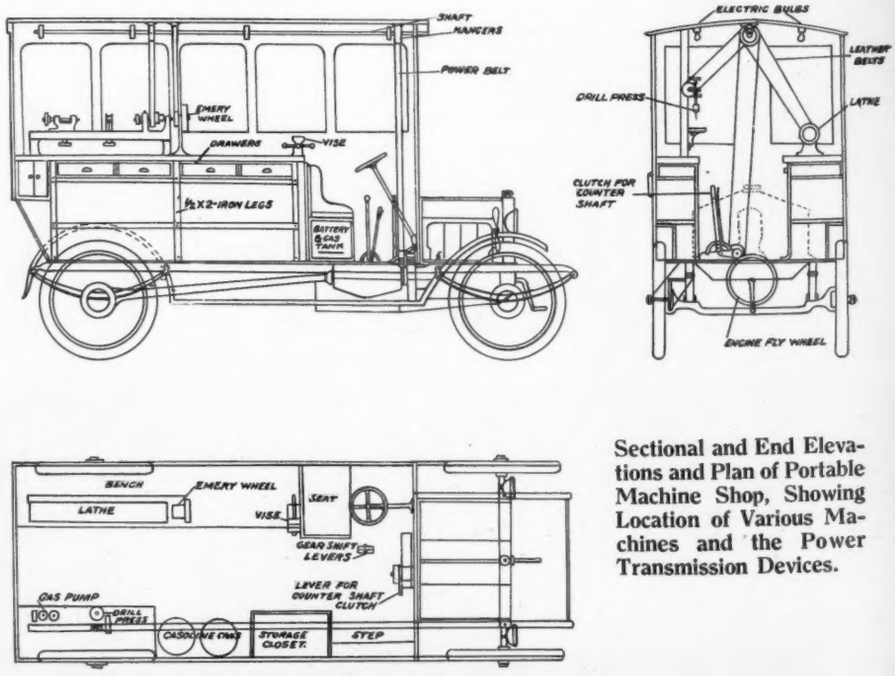
By P. P. AVERY, M. E.

THE following will give one an idea of how to make an old jitney bus into a portable machine shop by the use of the power plant and body of same.

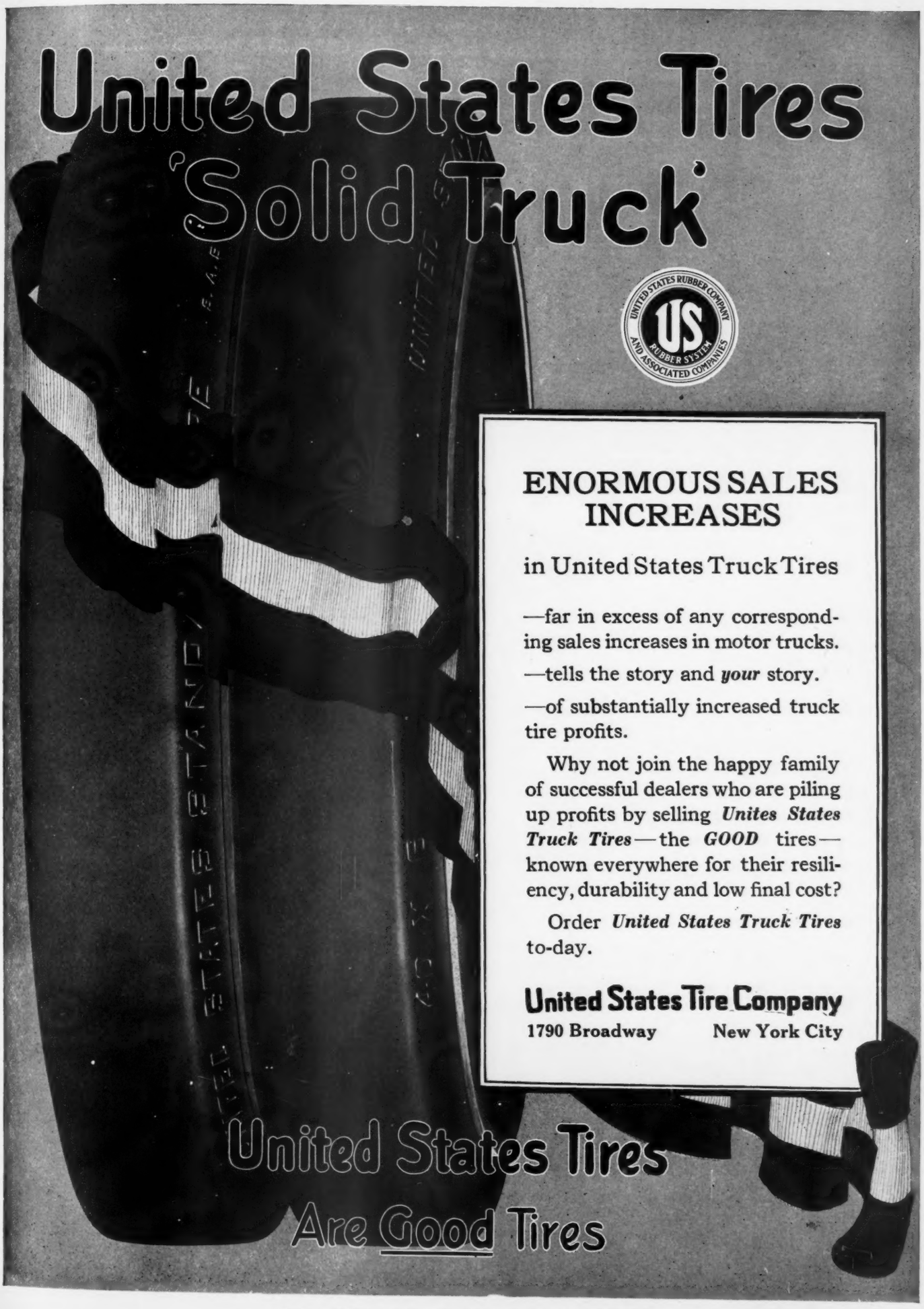
The engine of the chassis is to have a transmission belt which shall supply the driving power to the pulley wheels of the shafting, lathe, emery wheel, drill press, and cooling fan for use in hot weather.

The old seats of the jitney bus body are to be removed and the spaces left, if any, floored over, above which is to be built a 2-in. thick bench containing the following: a small bench lathe, a drill press, an emery wheel and buffer, both large and small bench vises. The bench will have drawers, shelves, racks, etc. Emergency supply cans of gas and oil, a hook for the tow rope on which it is to be coiled and hung, the rope preferably of 1½-in. hemp with two large iron hooks, one at each end, should be in the equipment. A small overhead countershaft is hung from the ceiling with the usual shaft-hangers and leather belts from there to the different machines. The power is transmitted to the countershaft from the engine by the use of a leather faced pulley and lever arm held in position by or released by the notched sector and lever latch with small spring which holds the latch in the desired notch. By moving this lever forward or backward the countershaft is started or stopped. Use any light shafting and 2-in. faced pulley wheels connecting to the machines by leather belting of the same size.

When the motor car is run from place to place the counter-shaft clutch lever shall be moved just enough so that driving pul-



Sectional and End Elevations and Plan of Portable Machine Shop, Showing Location of Various Machines and the Power Transmission Devices.


United States Tires
Solid Truck
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ENORMOUS SALES INCREASES
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—far in excess of any corresponding sales increases in motor trucks.
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Why not join the happy family of successful dealers who are piling up profits by selling Unites States Truck Tires—the GOOD tires—known everywhere for their resiliency, durability and low final cost?
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ley shall not engage the flywheel of the engine from which it takes its power.

When the auto arrives at its required destination and the "Machine Shop" is desired to be put into operation, have the transmission lever in neutral position with the emergency brake on and the engine running. Then throw in the countershaft clutch lever and the counter-shaft will start and the shop is ready for work. As the load increases on the bench machines the engine may be speeded to the desired speed. In making one of these portable machine shops try to procure a good serviceable second hand "jitney bus," preferably with solid tires on the rear wheels and pneumatic on the front, and a four-cylinder water-cooled engine of about 35 h.p. with exposed flywheel, so that counter-shaft clutch pulley may be readily placed in its relative position thereto. The slight difference in the tension of the counter-shaft belt, due to the raising or lowering of counter-shaft clutch, will not be noticeable, as the arc of the clutch pulley's movement is so slight.

It is a good idea to fit or attach a small electric generator to the engine or the counter-shaft so that electric lights may be provided for night work. These should be bulbs of 6 c.p. and located on the ceiling, also on the sidewalls over the machines. A storage battery may be added and kept charged by the generator during the daytime, which battery is for emergency use.

Build the work bench of good 2-in. spruce, 10 in. wide, and two planks bolted together with iron strips at each end, iron looped over at the wall, bolted thereto, and carried down to the floor to form legs. Run 1¼-in. angle iron across the front bolted to the legs, and, by nailing a batten to the wall, build a shelf across. Underneath the bench provide drawers for hand tools, etc.

A second-hand two-cylinder air pump may be added with power taken from the counter-shaft, with a 20-ft. length of pump hose attached to pump with a tire valve nipple on the end of the hose. The hose is to run through window in convenient place for road repairs, the entire apparatus to form a most efficient and serviceable portable "machine shop" for all kinds of repair jobs on farms or outlying districts. Its use to a broken down motor car in an isolated section and its many other advantages are quite evident. And for emergency jobs necessitating remaining out all night it is a very simple matter to build folding bunks to accommodate two or three men, and cooking may be done by the ordinary gasoline blow torch held in a vise with small wire bracket over the same to hold a coffee pot or frying pan.

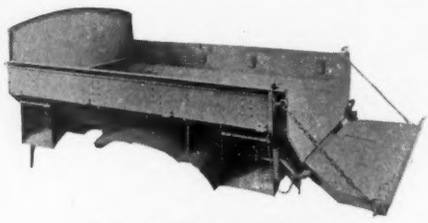
Allies Have 172,125 Motors

According to an investigation conducted by the Japanese Government the Entente Allies have 172,125 motor vehicles in use by the armies. Of these 30,000 are owned by England, 80,000 by France, 40,000 by Russia, 10,000 by Italy, 10,300 by Belgium, 1700 by Roumania and 125 by Serbia. The Central Powers have approximately 131,050 machines, of which 100,000 are owned by Germany, 30,000 by Austria-Hungary, 750 by Turkey and 300 by Bulgaria.

Truck Bodies in Various Styles

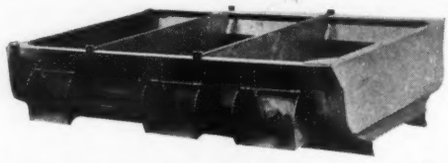
A line of truck bodies, including types suitable for various industrial uses, is being produced by the Auto Truck Steel Body Co., 3028-46 Carroll Ave., Chicago, Ill. The Model A bodies are most popular by reason of their wide range of usefulness made possible by utilizing various attachments.

These bodies are shipped complete, ready for mounting. They are made of No. 8 U. S.



A Model A4 Standard Body

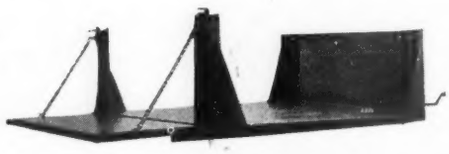
gage steel plate, unless otherwise specified. The number of seams is reduced by using sheets of the greatest possible width, thus decreasing the possibilities of rusting. Rivets are placed at close intervals and are air-



Model A Standard Body With Removable Partitions and Chutes

hammer driven while at a cherry red heat. This method is said to insure a perfect fit.

The Model A bodies are made with or without flare at the top, square or round



Model A2 Platform Body Has Removable Wood Side Boards

corner at the bottom and a manually operated closing tail gate. Bodies that are less than 24 in. high have a tail gate extended to 24 in. The asbestos lined body, Model A, has an outside shell of No. 8 steel with a ½-in. covering of asbestos which is lined with No. 14 steel, 6 in. wider at the rear than at the front to allow easy dumping. Listed in this line of bodies is a garbage carrier claimed to be waterproof.

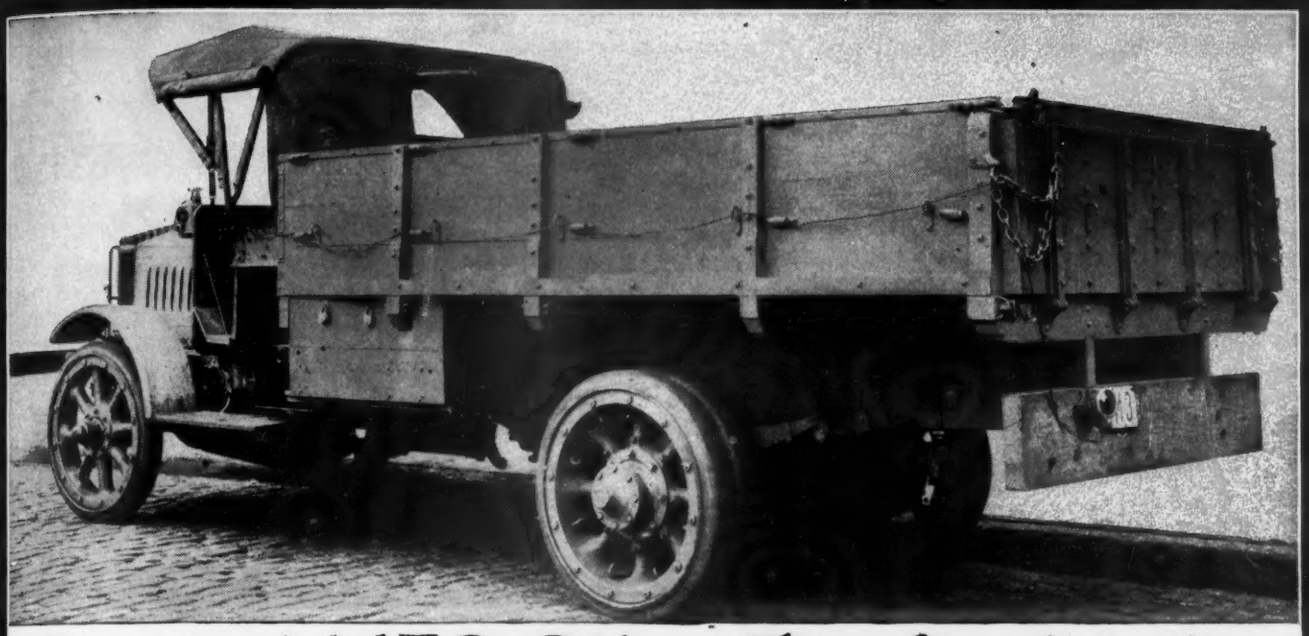
By sending to the manufacturer, the make, model and tonnage of truck and what is to be hauled, complete specifications of the equipment required will be submitted. Everything above the chassis except wood sills is furnished.

A standard removable bagging chute, suitable for attaching to all the different types of bodies, is also made for use in handling various materials, such as coal, which may have to be delivered piecemeal. This chute is hinged to the tailgate of the body and is held in place by a hooked rod attached to a steel yoke at the rear of the chute and to an eye at the top of the tailgate. A vertical sliding steel door that controls the flow of the material is provided.

Testing Air-O-Flex Suspension

Five motor trucks, the first to be built by the Air-O-Flex Automobile Corp., will be sent out on long trips in charge of experienced experimental engineers. One of the five will be an ambulance and the other four will be of the regular commercial models of the company. These trucks will go in five directions from Detroit, reaching Tidewater in each instance. These trips are intended to test the Air-O-Flex suspension which takes the place of springs, and the reports of the engineers will serve as guides in the improvement of the models. Plans have been prepared for a group of factory buildings, to be constructed in units, for the manufacture of the Air-O-Flex truck. It is planned to make the output 10 trucks per day in the first factory unit and to increase the production proportionately thereafter.

Partial View of the Factory and Yards of the Auto Truck Steel Body Company



One of 1650 RikerTrucks for the U.S. Army Equipped with Smith Wheels

"EVERLASTING"

THE remarkable **Lightness,** the unequaled **Strength,** the everlasting **Endurance** that enable Smith Wheels to meet most satisfactorily the difficult conditions under which War Trucks are operated, make them unquestionably the most desirable **for commercial use.**

Smith Wheels save their cost in Tire and Gasoline Mileage in the first few months they are run.

Smith Wheels guaranteed **FOR LIFE OF TRUCK** on which originally placed

Smith Wheels will prove a most profitable investment for you. They will make your truck last longer. Insist on Smith Wheels every truck you buy.

SMITH WHEEL INC.
SYRACUSE, N.Y., U.S.A.

Schofield Auto-Tractor Unit

THE unique feature of the Schofield device is that its use does not necessitate changing or dismantling any part of the car that is used to operate it. The illustration shows a Maxwell car mounted on the Schofield auto-tractor, although any size car can be used. In other words, work of from four to twelve horses can be done, depending on the size and power of the automobile employed.

The Schofield Laboratories Co., of 318-20 S. W. Boulevard, cor. Broadway, Kansas City, Mo., builds this tractor in two models. The first accommodates a car up to 110-in. wheelbase, while the other is equipped with an extension frame that is attached by four bolts on each side and will accommodate cars of the longest wheelbase. Any car can be used by simply attaching a sprocket to each rear wheel hub flange and two small castings to the rear axle which may remain permanently as they do not interfere with the looks or operation of the car and add only about 10 lb. in weight.

Any Make of Car Can be Employed to Operate the Schofield Auto-Tractor

After this has been done the car is run on top of the tractor frame by means of skids which are furnished. Drive chains are put on the sprockets on the rear wheels of the car, then the rear part of the car is raised so that the rear wheels are clear.

Belt work of all kinds from pulling a separator to the lightest work of this nature is done by a simple attachment quickly put on and removed when desired.

Loads of from two to ten tons can be hauled at a speed of from three to five miles per hour, depending on the power of the car.

On account of the construction of the bearings, bridge construction, hot riveting, etc., perfect flexibility is assured regardless of the position of the wheels. The bearing construction is novel. For instance, the roller bearings have a cage contained in another ball-shaped cage that clamps over the roller housing or bearing and is readily replaced in case of wear from continued use. Should a bearing or cage wear out or become loose, or should it become necessary to replace one, or through an accident of some kind should it become necessary to replace a jackshaft or bearing, a Ford rear axle can be substituted because it is exactly the same size and answers every purpose. Likewise the Ford rear axle, Hyatt roller bearing, also housing, or casing or bearing, which means every Ford agent is a service station for the Schofield Auto-Tractor. The only thing there might ever be a tie-up on or delay would be in the bearings or the jackshaft, and as they are interchangeable with the Ford it does away with any possibility of the farmer being delayed at a time when be cannot afford to.

The general construction of the Schofield tractor is as follows:

The rear wheels are 36 x 10 in., front 28 x 4½ in.; wheelbase is 102 in.; tread, between inside of rims of wheels, 72 in.; front axle, 1 11-16 in., cold rolled; rear axle 1 15-16 in., cold rolled; steering irreversible.

The inside members are runways for the wheels; are angle steel 3½ x 2½ x 3-16 in., the 3-in. part of the angle being vertical. There are two of these on each side of the machine which forms a channel. On the front end there is a 5-in. channel, 3-16-in. web and 1¾-in. depth. Across the center there is another 5-in. channel. On the rear is a 6-in. channel with a 2-in. depth and ¼-in. web. The angles are hot riveted to the channels, the hot rivets being ½ in. in diameter forced into holes that are countersunk and 9-16-in. smallest part, which means that rivets are 9-16 in. or larger when head is forced on both sides of frame. The head is 1 in. in diameter.

The road speed of the device is from 3 to 6 m.p.h., and in field work 2 to 3 m.p.h. The price of the Schofield tractor is $295.

THE HOFFMAN-GIFFORD Co., Youngstown, O., has taken the agency for the Bethlehem trucks made at Bethlehem, Pa. This line consists of 1¼ and 2¼-ton trucks, with additions this year of dump trucks, tractors and trailers.

American "Ford-A-Tractor"

The American Ford-A-Tractor Co., Kasota Bldg., Minneapolis, Minn., is manufacturing a tractor attachment for Ford cars that embodies several interesting features. The gears are all enclosed to protect them from dirt and keep them properly lubricated. Another feature is a threaded gear adjustment that enables the gears to be kept in proper mesh at all times. This feature prevents excessive wear due to loose gears. Smooth and noiseless transmission, a saving in power and the use of any size pinion gears are the advantages claimed.

The gears are cut from a solid piece of steel shafting and are bored tapered and case hardened. A casing flooded with oil encloses and protects the gears and the bearings on the rear axle of the Ford. The cold-rolled steel axle is placed directly behind the Ford rear axle and supports the entire weight of the car. It is 66 in. long. Strong wheels with angle iron lugs are designed to withstand excessive strain.

The back end of the Ford car rests in a cradle formed by the heat-treated, steel side bracket which runs from the Ford-A-Tractor axle to the sides of the car. Two shock absorbers connect the cradle with the frame of the car. These shock absorbers are two pieces of steel, 2 in. wide, shaped to slide in special shackles. This is said to give free motion, both vertical and horizontal.

Ford-A-Tractor Breaking Ground on a Farm

For road work where a speed of more than 3½ m.p.h. is desired, special road pinions are furnished at an extra cost. The Ford car, when equipped with a Ford-A-Tractor attachment, is said to be capable of executing the work of three horses. The price of the attachment is $145 f.o.b. Minneapolis, Minn.

THE MARTIN-WHITEHALL Co., of Pittsburgh and Cleveland, has leased the property at Youngstown, O., formerly occupied by the York Sales Co., and will handle Republic trucks exclusively. Frank B. Phillips, of Pittsburgh, has been appointed manager of the Youngstown branch and will reside in Youngstown.

All phases of the truck industry covered best in the CCJ

ATTERBURY

Can you say this about your motor-trucks?

"Our Atterbury has worked continuously seven days a week for five winter months without missing a day."

"One of our Atterburys has run 65,000 miles and is still in use."

"Our Atterbury is the cheapest truck to operate of the several we own."

"Our first Atterbury is 3½ years old and after making 60,000 miles is still giving good service."

"We have driven one Atterbury 7000 miles—repairs $5.18."

"Used one Atterbury from December to April—not one cent for repairs."

The man who buys a truck does not care about the opinion of the dealer who sells the truck or of the manufacturer who makes it. What he wants to know is—how it will stand up day-in and day-out when it is on ***his*** payroll.

That is why we let Atterbury users tell you what the Atterbury does for them—how it is on the job six and seven days a week, winter and summer, with the very minimum of trouble and repair expense.

The Atterbury makes money for Atterbury dealers because it makes friends for them. Investigate!

Atterbury Motor Car Co. Buffalo, N.Y.

We would like to send you a copy of our new folder entitled "What We Know About the Atterbury," written by Atterbury users. Ask us for it.

MOTOR TRUCKS OF ATTERBURY Buffalo, N.Y. MAXIMUM SERVICE

Atterbury trucks sell because they serve

Private Motor-Truck Freight

The unprecedented traffic conditions that exist throughout the country as a whole, but particularly around the manufacturing and distributing centres, have caused tie-ups and delays that cannot be relieved by the railroads and steamship lines, so the larger manufacturers and the more progressive merchants have turned to motor trucks in all lines of industry.

The D. G. Dery Co., the largest manufacturers of dress silks in America, for instance, who have eighteen factories and mills within a radius of fifty miles of Allentown, Pa., with warehouses and distributing offices in New York, are depending almost wholly upon motor trucks for moving their raw materials from mill to mill and their finished merchandise from their various mills to their warerooms and distributing offices in New York.

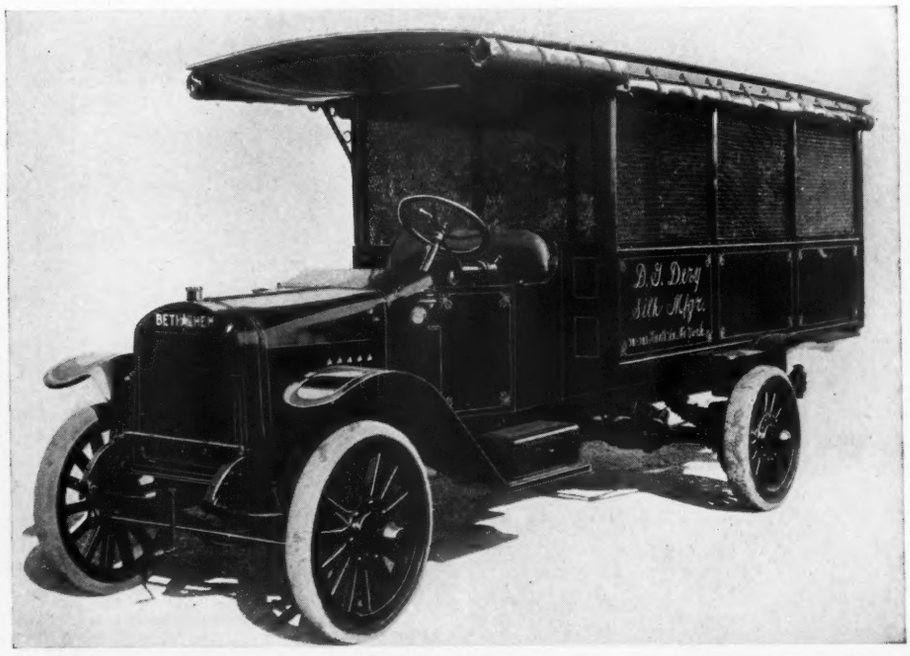
The entire handling and freighting of all the materials that are moved every day between these eighteen big silk mills and New York City is taken care of by the Dery fleet of Bethlehem motor trucks.

The Dery fleet consists of ten Bethlehem 2¼- and 1¼-ton trucks. These trucks run on regular schedule every day between New York and Allentown, a distance of ninety-four miles through hilly country and a daily schedule between Allentown and the seventeen other mills from ten to fifty miles apart.

These ten Bethlehem trucks have not only relieved a hopeless condition in the Dery organization, which, owing to war traffic had fallen behind, not only in their deliveries, but in their tremendous manufacturing output—but have also established a schedule of deliveries between the mills and the New York offices and between the various mills, that was never equalled or even approached when traffic conditions were normal or even light.

The Bethlehem trucks that run between New York and the Dery Silk Mills are used also to deliver finished silks to merchants and garment manufacturers throughout the metropolitan district and to Philadelphia and intermediate points. To use the words of the Dery traffic manager, the "Dery fleet of Bethlehem trucks is always on the road."

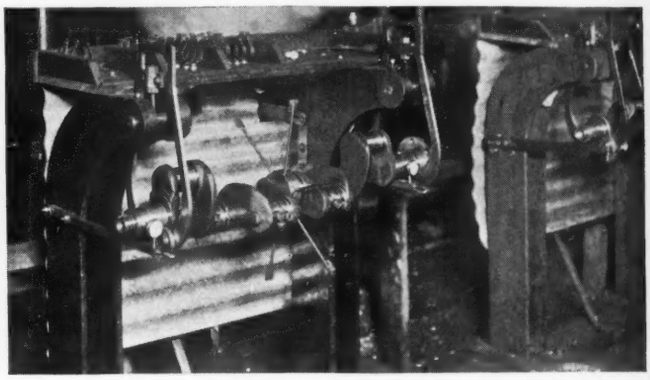
This plan of the D. G. Dery Co., using Bethlehem motor trucks for freight and express between points up to two hundred miles on schedule, is not unique. The same plan is being carried out by manufacturers and merchants at points all over the country, but particularly in the eastern manufacturing districts, with the same success.



One of the Bethlehem Trucks Used for Long-Distance Deliveries by the D. G. Dery Co.

New Machine for Balancing Engine Crankshafts

For some time past the accurate balancing of crankshafts has been studied by the Continental Motors Corp., of Detroit, Mich. This concern has designed an apparatus, the principle of which depends upon the impinging of a jet of compressed air against the surfaces of the vanes of a turbine impeller. One of the salient features of this machine is that the means of rotation does not affect the actual or apparent condition of balance of the shaft.



A Near View of the Air-Turbine Machine Used by Continental Motors Corporation, for Balancing Crankshafts

Quite an advance in the method of properly balancing crankshafts is disclosed in the unique construction of this machine. A pair of stirrups hung on pivots is used to support the crankshaft. The center-line of the shaft is directly beneath the center-line of the pivots. Hardened steel anti-friction rolls are fitted in the stirrups and spaced to make contact with the journal at either end of the shaft. The turbine wheel, which has six flat blades, is fastened to the center main bearing of the shaft.

Two micrometer dial-gages, mounted on independent supports, make contact with the shaft at either end. The vibrations of the shaft, when running, are shown at each end by the readings of the dial-gage.

The diameter of the wheel is 18 in. The area of each blade is 1.56 sq. in. The air issues from a horizontal pipe having a deflector on the upper side of its nozzle. The orifice is located at a line tangent with the highest point of the impeller blades and about 3 in. back of the center-line.

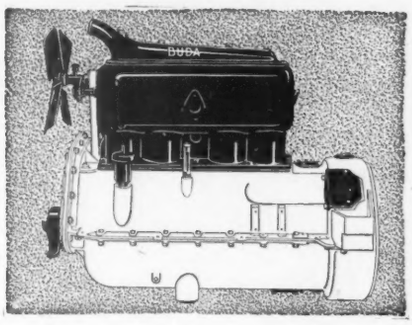
The shaft is rotated by opening the air valve, the indicators quickly showing if the shaft is out of balance, and the amount of variation from zero on the gage indicates the values of unbalanced masses in the shaft. The shaft is immediately stopped and small balancing weights, attached to spring clips, are snapped over the crank pin opposed to the unbalanced section. The shaft is again put in motion, the indicators telling the operator at once on which crank pins additional weights should be placed in order to bring the shaft to balance. These spring clips have fitted to them pieces of steel of the same diameter, but of different length, each carefully calibrated. When the shaft is balanced, the crank pins may have several weights fastened to them, and in this condition it is handed over to the next operator who removes the correct amount of metal, as indicated by the algebraic total of the calibrated weights attached to the shaft when he receives it. When he has completed this operation, the shaft is returned for final checking.

This arrangement permits the shaft to turn freely about its axis, because it is not affected by any mechanical method of rotating. As the shaft is not held solidly in any one position, every factor which would affect the condition of balance is eliminated.

This machine is used exclusively by the Continental factories, and it is understood that excellent results have been obtained in dynamically balancing crankshafts.

Advertising in the CCJ is memory insurance. "Out of sight, out of mind," you know

"LET US HAVE THE FACTS"—No. 9



LUBRICATION

Nearly every type of motor presents its own peculiar lubrication problem. Efficient and economical lubrication is largely a question of design — an elaborate oiling system being of little avail if the motor has any radical features which make it difficult to *maintain* oil in sufficient quantities and under sufficient pressure at all points of wear and at all speeds.

The BUDA MOTOR

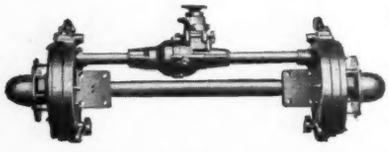
is a *developed* motor. Its initial design was in accord with the best practice — its present form is simply a careful development of it. BUDA engineers have incorporated in their designs the oiling systems which experience *in practical use* has shown to be the very best. Permanent positiveness of lubrication of *all* moving parts at *all* speeds and under *all* possible road conditions is absolutely assured. A sectional drawing showing the effective arrangement of parts and details of the oiling system is in the

BUDA CATALOG

Write us for it.

THE BUDA COMPANY, HARVEY (Chicago Suburb) ILL.

THE BUDA COMPANY
BUDA MOTOR
"The part to buy the car by"
ESTABLISHED 1881



Russel Features

The power axle is entirely independent of the load-carrying axle, wholly relieving it of road and load strains.

The load-carrying axle is a one-piece round bar of heat-treated chrome nickel steel.

The Russel Differential, Internal Gears and Pinion Gears are made in our own machine shops guaranteed by Russel reputation.

Russel brakes are exceptionally large and afford unusual protection to the truck on the crowded thoroughfare and steep grade.

I am the heavy-Duty Truck. I am at once the most ancient and the most modern of things. I am the resistless force of Nature, harnessed by Science to do the work and bidding of Man.

I am the drudge, the docile Giant of Industry, conceived in the mind of Man for whom I perform stupendous Labor unceasingly. Where huge holes go deep down into the earth, where huge new buildings pierce the Skies, where Science shows Man the way to New Marvels, there I am found—always working.

Science is the Brains. I am the Brawn. And I am resistless, patient and uncomplaining.

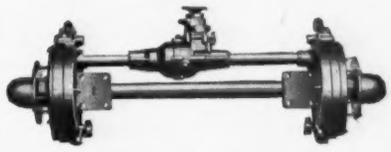
I am all these—the Heavy-Duty Truck. I am equipped with the Russel Internal Gear Drive Axle.

Russel

I am the Light-Duty Truck—the greyhound of Industry—certain, swift and sure-footed. Where the great moving forces of the world meet—where railroads and steamships join in the throbbing heart of commerce—there I am always found to make the last quick shift in the handwork of men.

I am certain—because I am designed and wrought cunningly to meet all needs and tests. I am swift—because time is priceless and perishable are the goods I carry. I am sure-footed—because I must speed through mud and snow and broken pavements—surely and uncomplainingly.

All these I am—certain, swift and sure-footed—the Light-Duty Truck. I am equipped with the Russel Internal Gear Drive Axle.



Russel Features

Less complicated parts.

More efficient and reliable under all conditions of road or load.

More ground clearance.

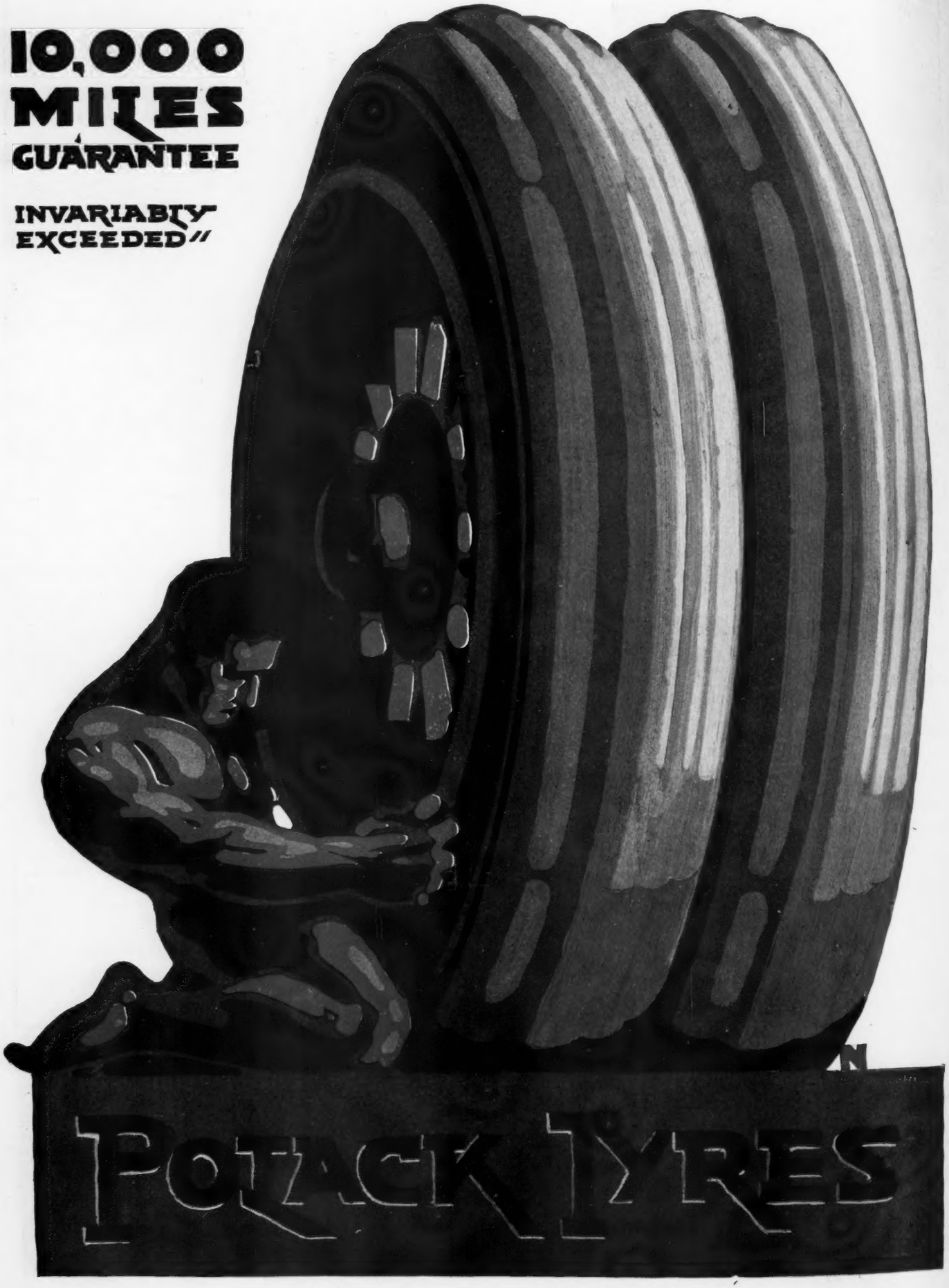
Less dependent upon lubrication.

Operating cost less.

Assures more tire mileage.

—THAN OTHER TYPES

Internal Gear Drive Axles


10,000
MILES
GUARANTEE
INVARIABLY
EXCEEDED"
POTACK TYRES

CHILTON TRACTOR JOURNAL

Use of Farm Tractors in the Northwest

By H. H. HARWOOD

At the present time no man can estimate with any exactness the extent that the tractor will modify existing methods of farming. But it is apparent to all that methods are changing from animal power to mechanical just as fast as manufacturers can turn out machines.

This is what happened a few weeks ago on a farm within a hundred miles of Spokane, Wash.:

A dealer who was onto his job sold a farmer one of the new two-row motor cultivators which are being placed on the market commercially this season. An expert was sent to help start the outfit and instruct the farmer in its operation and care. Within an hour or so of the time the expert and the motor cultivator reached that farm the owner's fifteen-year-old son was running the outfit with ease and doing about as good a job of cultivating as any man can with a single row cultivator and a well-trained team.

The life of a tractor cannot be properly expressed in years alone. The tractor is a machine, and like all machines, its life depends on the amount of work it does and on the care taken of it

That boy and a machine were doing work that heretofore has been accomplished with but rare exceptions by two men and four horses. What is more, the machine can keep going longer hours than the horses.

Apostles of gloom for some years have been going about the country bemoaning the poor judgment of farmers who allowed themselves to be inveigled into buying tractors when they would have to keep all their horses anyway for cultivating. What a shock it would be to one of these pessimists to see such a sight as the one related.

Suffice it to say that the tractor has a great future. Its influence may be more sweeping than even the most ardent enthusiast now dreams. For it does more work in less time and with less labor, which is just what the reaper, the harvester and the binder in turn accomplished.

The following report from O. F. Weske, who farms 600 acres with a tractor having 8 h.p. at the drawbar and 16 h.p. on the belt, is especially interesting.

One man, 6 months at $65 a month	$390.00
One man, 22 nights at $2.50 a night	55.00
Repairs used on tractor, plows, disks and drills	56.22
Gasoline and lubricating oil used	333.45
Figuring 20% depreciation on tractor and 10% on the other machines	195.00
Interest on $1200 invested in tractor and other machines	72.00
Miscellaneous expense	54.44
Total cost of putting in 600 acres in wheat	$1,156.11

This is a total cost of $1.93 an acre, which, of course, does not include harvesting. When harvest time comes two binders are hitched behind the tractor and the work goes ahead pretty fast when it is done in this way.

In comparing this work with that done by horses Mr. Weske says:

"At the time I put these figures together I was eager to know how they compared with the cost of doing the same work with horses; so I worked out the following comparison between the two methods: I have two horses, which I have owned for the last nine years, so I figured up the cost of these for the nine years and then divided it by nine to get the average cost of the horses per year. The result was $276.04, or $138.02 per year per horse. My tractor, which has a capacity of 8 h.p. on the drawbar and 16 on the belt, is equal to at least eight horses. If you figure the cost of feeding one horse for one year at $138.02, it will cost $1,104.16 to feed eight horses. The cost of the fuel and oil for the tractor is $333.45. The difference in cost in favor of the tractor is $770.71 a year. Furthermore, it required only one man to operate the tractor and the implements behind it. It would require at least two men to drive the eight horses, which means the additional expense of one man. More time is required to take care of eight horses than to take care of one tractor,

The farm tractor is essential as a one-man outfit, and its utility to the farmer lies partly in the fact that with it, one man controls a large amount of power

Clarence Young Plowing His Hundred and Fifty Acre Farm in Chehalis, Wash.

After charging every imaginable expense against the machine, Mr. Young finds that he can still operate at a saving of about $1 an acre over horse power

and, counting the original cost of eight horses and harness, it would mean twice the amount invested in horses as in the tractor. I think that sometimes we farmers do not realize that we can buy tractors cheaper than we can buy horses for the same work. The depreciation on eight horses and eight sets of harness would be much more than the depreciation on the tractor, and the interest on the investment would be at least twice as large.

"Besides making this splendid saving by the use of a tractor instead of horses, I do not believe that any average eight horses would do the same work under the same conditions that was done with this tractor and do it so well. We had very little rain while the work was being done, and I am sure the horses would not have stood up under these trying conditions. The tractor, however, works even better when it is hot than when it is cool. Moreover, you know that the average farmer who puts in as much as 600 acres of wheat keeps more than eight horses."

When you can take a tractor which costs less than $1000 and do as much as three two-horse teams can do in a day's time, why isn't that tractor worth much more than the teams? Take six horses—their harness and plows—and you have at least $1500 invested. Your wear and tear on harness and horseshoes are double or more what the wear and tear is on your tractor, and the feed consumed each day for six horses will run an average size tractor two days, and at the present high price of feed it would suffice for two and one-half days.

It takes three men to drive three walking plows. Their wages are $1.75 per day each and board, or $2.25, and they board themselves. As to figures in regards to tractors, I can give them only for the tractor that I have:

One man, 10 hours' work at 25 cents per hour	$2.50
12 gallons distillate at 11 cents per gallon	1.32
1½ gallons heavy duty lubricating oil at 59 cents a gallon	.88
Any good cup grease, 15 cents	.15
Total	$4.80

So you can see that it isn't as expensive to run a tractor as it is to run three teams, because

Three men at $2.25 each	$6.75
Oats per day for 6 horses of 7 lb. per horse, three feeds, 126 lb.	2.20
Hay, 20 lb. per horse twice a day, 240 lb. at $10	4.32
Total	$11.37

Now you have the running expenses for a day of ten hours, and these figures are just what it is costing me each day, except the feed, which I raised for less than the prices I have given, but if I had to buy this feed my figures are correct. Now let's see how much work is done. With my tractor I plow six acres per day of 10 hours each. It pulls two 14-in. bottoms and I am plowing from five to eight in. deep. In plowing six acres my cost per acre is 80 cents per acre and if I wanted to speed up my tractor I could do more; but what is the use of tearing up a machine in one day and then lay off a week just because you want speed? Try to get speed out of your teams and you will also have trouble. We will say that the three teams will plow six acres. At that the average cost per acre is $1.90 against 80 cents for the tractor. That isn't all. These figures apply only when your tractor is at work. When it is idle it doesn't eat anything; nor does it have to have a man to curry it or water and feed it the balance of the time.

Still there is more to consider. Your outlay of cash is to be taken into consideration. Your tractor and plows cost only $1000, and your teams, plows and harness at the very best would be $1250.

Further, you can't cut ensilage, roll or clean grain, saw wood or run a separator with a team of horses, but I do the above with my tractor.

Since September 1, 1916, my repairs have amounted to only $3.75. That was for a bronze boxing which burned out because my hired man didn't have sufficient oil in the case. Of course, it got hot and melted in a short time.

I have two 131-ton silos. I put 83 tons of oats and vetch at a total cost of $17.90 or $1.43 a ton, in one silo last year, which I consider the cheapest hay or roughage I ever used. Any farmer who has 150 acres or more that hasn't a tractor is losing money every year.

"In conclusion, I want to say that we can't get along without horses, but we can prolong their lives, make their lives worth living and put more dollars in our pockets by having a tractor," says R. C. Hoskinson, of the Oak Ridge Stock Farm, Buell, Oregon.

As an example of what the farm tractor is doing in the Northwest, a few examples are given herewith which may prove interesting:

Near Sunnyside, Wash., a tractor selling for $985 plowed in a field one and one-half miles around a depth of 10 in. up a 15 per cent. grade. The cost of plowing this land was figured at 50 cents per acre, including gasoline and lubricant. The total cost, including depreciation, interest on the investment and every item of expense, was figured at $2.15 per acre as against $2.85 with horses, which had previously been figured.

To the farmer, the tractor has opened up innumerable ways of saving money, by increasing his capacity for work in a given period, at a lower cost

Two Bull Tractors Plowing on a Three Hundred Acre Ranch Near Sunnyside, Wash.
It costs the owner $2.15 per acre to plow with these machines, as against $2.85 with teams. And this does not include the saving of time

On another farm near North Yakima the information has recently been obtained that a small tractor filled a 90-ton silo in thirteen hours at a cost of $5.06. It had previously taken two days to fill this silo and the expense consisted in hiring a team to haul coal to the stationary engine and a team to haul water.

At Reardon, Wash., recently, fifteen acres were plowed with two 14-in. plows at an average of an acre an hour.

In the LaConner Flats tractors are successfully operating disc plows, cutting 20 in. furrows to a depth of one foot in hard pan soil where five horses formerly found impossible to break.

Otis Long, a farmer of Kennewick, Wash., uses a tractor which handles three 12-in. bottoms with excellent success over ground, part of which has a grade of 10 per cent. for a quarter of a mile.

Charles Johnson, of Enumclaw, Wash., is operating a small Samson-Sieve-Grip tractor and using it to pull a binder on belt work as well as plowing. Mr. Johnson is highly satisfied, having used a tractor this year only, and states emphatically he would not trade it for all the horses in King County.

Other tractors near Enumclaw are averaging four-fifths of an acre an hour plowing.

Tractors are proving highly successful and profitable in orchard work in southern Washington. Sam Russell, of Washougal, Wash., is using a tractor to plow between his trees, up a 12 per cent. grade, and finding it a profitable investment, although the original cost of the tractor is $1600.

Clarence Young, a successful farmer of Chehalis, Wash., is farming 150 acres of some of the finest land in western Washington. Mr. Young went into the tractor situation very thoroughly and after charging overhead, actual cost of operation, de-

preciation, interest on the investment and every imaginable expense against it, finds that he can still operate at a saving of about $1 an acre over horse power.

In the enormous wheat ranches of eastern Washington caterpillar tractors are being used quite successfully in pulling from six to sixteen bottoms as well as the enormous combines used by the farmers in that vicinity. Every known make and type of tractor is being used in the Northwest, which may be due to the fact that the farmers are a little bit more progressive, or to the fact that the territory is so spotted that frequently in the radius of fifty miles three or four different types of tractors must be used. In other words, the soil in parts of Washington is so spotted and is so light that many tractors find it impossible to work. In other places the ground is so hilly that the grades cannot be negotiated. Still again the ranches are so large in some sections it does not pay to put on a small tractor when a large one can be accomplishing so much more work.

The whole tractor distribution question in the Northwest, as well as in other sections of the country, resolves itself in the final analysis in the ability of the distributor to sell his prospective customer the tractor best suited for his needs and an honest and sincere desire on the part of the vendor to make it prove profitable to the farmer. A distributor supposedly having in his mind certain facts from his experience and being able to tell more clearly what a tractor will do under certain conditions, should freely, willingly and sincerely give those facts and the benefit of his experience to the purchaser of his merchandise. The distributor who, today, is striving earnestly and sincerely towards placing tractors where they are capable of being used profitably, and who looks over the individual conditions of each case before he places a tractor in operation, is the distributor who is building for a permanent profitable business.

No horses can possibly do the quality of work that can be accomplished by an engine. Anxiety to spare the team has cut a big slice off the profits of the Farmer

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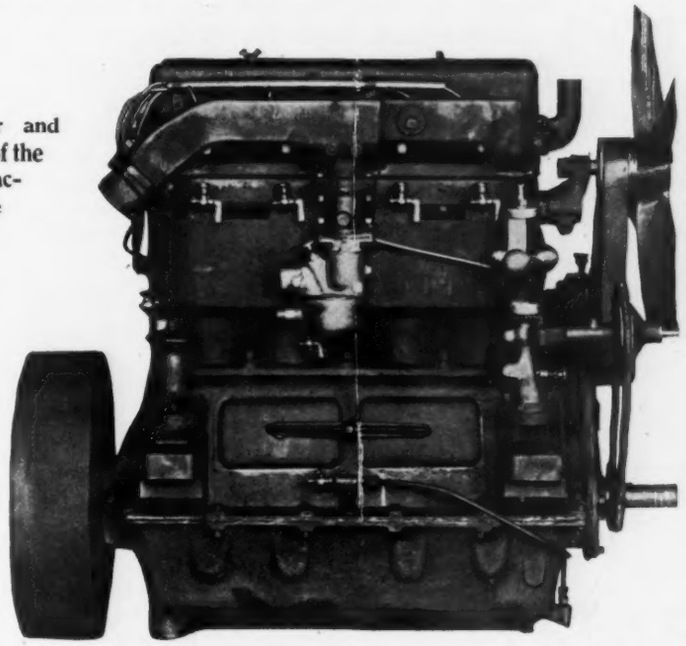
HENRY FORD & SON, Detroit, will be unable to place the Ford tractor on the market for some time, owing to the fact that they have large contracts with the English Government.

THE LA CROSSE TRACTOR CO., La Crosse, Wis., in addition to its shipment of 50 model A and 2 model B La Crosse Happy Farmer tractors recently to France on order of Gaston, Williams & Wigmore, Inc., New York City, has received another order from the same source for 250 tractors of the Model A design, to be shipped October 20th. These tractors are for the use of the French Government in raising crops for 1918. Both plants of the La Crosse Tractor Co. are being speeded up as rapidly as possible.

Overhead Valve Tractor Engine

Because of a more symmetrical combustion chamber and relatively less water-jacket space, the valve-in-head engine is considered by some to be the best suited for farm tractors and trucks.

The Erd engine, with valves in the head, is simple in construction, provides easy access to all parts that require occasional adjustment or attention and is built to render economical and dependable service for long periods, under varying conditions. Regrinding of valves, removal of pistons for cleaning and the removing of carbon are made easy by having a removable cylinder head.



The Carburetor and Exhaust Side of the New Erd Tractor Engine

The new Erd valve-in-head engine is designed and built for tractors and trucks only. One size and one general type is made, which is standardized throughout.

Details of Construction

The oil pan of the engine contains the surplus lubricating oil in which the oil pump is submerged, at one corner of the pan at its lowest point. This pump is of the plunger type and is operated from an eccentric on the camshaft. All the reciprocating parts of the engine and also the timing gears are splash lubricated. The bearings are provided with large oil retainers. The pump and strainer can be removed for cleaning without disturbing any other part of the engine.

On both the open-flywheel, 4-point suspension, and the closed-flywheel, 3-point suspension type, the valves, push rods and rocker arms are completely enclosed in a dustproof case.

The cylinder head is a gray iron casting that contains the eight valves. Each valve guide has a cast iron bushing that can be renewed when necessary. The intake manifold is cast in the cylinder head. The exhaust manifold is a special design and contains the part of the intake manifold to which the carburetor is bolted.

The oil pan is bolted to the crankcase casting. The crankshaft is drop forged steel provided at the rear end with a flange to which the flywheel is bolted.

The cylinders are a special mixture of gray iron, machined and counter bored. The pistons are cast iron, ground to size and provided with three ¼-in. rings placed above the piston pin. This pin is hollow, case-hardened and ground, and turns in the piston in a bronze bearing.

The connecting-rods are drop forged steel, the upper end clamping the piston ring and the lower end being fitted with adjustable bronze-backed bearings. The connecting-rod bolts are nickel steel. The nickel-steel valves are electrically welded to carbon-steel stems.

The camshaft is 1¼ in. diam., forged in one piece and provided with three bearings. The rocker arms are drop forged and accurately ground and case hardened at both ends. The timing gears are helically cut.

The bore of the cylinders is 4 in. and the stroke of the piston, 6 in. The recommended speed is from 700 to 1000 r.p.m. Cooling is obtained through a centrifugal water pump. The engine is equipped with a radiator fan, an oil indicator, four priming gears, grease cups, drain cocks, head and spark plug wrenches.

Both gasoline and kerosene can be used as fuel in the Erd tractor engine. It is a product of the Erd Motor Co., Saginaw, Mich.

Cleveland Tractor Company Increases Capital

After six months of business, the Cleveland Tractor Co., Cleveland, O., has increased its capital from $600,000 to $6,000,000. The demand for the product of the concern has been so great that the company, which has been in business only since April last, has been obliged to enlarge its manufacturing space five times over. Rollin H. White, of the White Automobile Co., is president of this concern.

Make your product pay—advertise in the CCJ

Pioneer Gasoline-Engine-Driven Thresher

One of Its Inventors Relates How This First Gasoline-Powered-and-Propelled Threshing Machine Came Into Existence

By LEWIS JONES

EARLY in the '90s two young farmers and threshermen living in central Ohio, recognized the desirability and urgent need of a motive power for threshing and portable work generally, that would eliminate as far as possible the objections and drawbacks of the steam engine for this class of work. They had good reason, on account of two or more fires, to dread the ever-present danger from sparks, from smoke-stack or ashpan, especially when the fuel furnished was wood partly decayed, such as old broken fence rails and limb wood which carries a smoldering firelike tinder, and this at the season when dry vegetation ignites so readily. Much of the water supply available was of bad quality, totally unfit to put into a boiler and moreover was difficult to procure; often being pumped from deep wells or dipped from stagnant fish ponds and hauled in a tank wagon (in some localities two miles or more) requiring the entire time of one man and a team of horses. Under such conditions the process of getting up and maintaining steam enough required the constant attention of one man. These and other things "too numerous to mention" set these young men thinking. The gasoline engine, at this time, was making favorable headway in "stationary" work, and therefore the question arose: why not adapt it for portable use? Surely, why not?

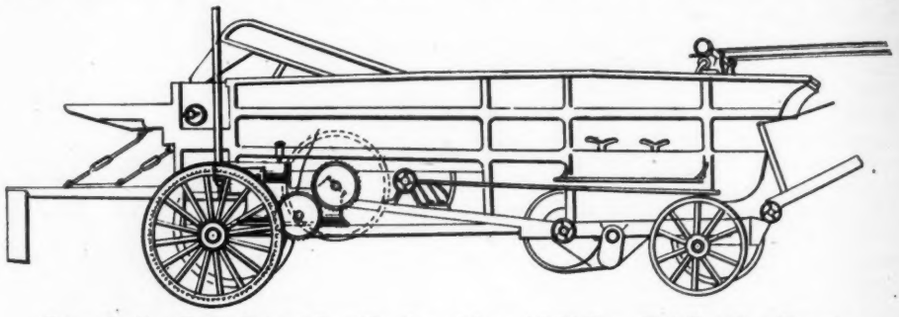
The venture was decided upon, plans drawn up, and an application of the invention made up, on which a caveat was granted by the U. S. Patent Office under the heading of "an improvement in threshing machines," filed February 28, 1893, which described and showed a gasoline engine mounted on a grain thresher in such a manner as to both operate the machine for threshing and also to propel it from place to place. This, I believe, is the first official record in the Patent Office of such a combination being designed.

The Selden patent was dated 1895, and covered only the feature of propelling a vehicle by an internal combustion engine. While the caveat referred to issued two years and ten months before (1893) and featured not only the propelling from place to place, but operating the machine for threshing grain or doing other kinds of work or driving other machinery, either function independently on both simultaneously. While the Selden application was filed earlier, the fact that it had been was not known to these young men at that time, so that it is believed that since this caveat antedates the Selden patent by more than two years, it at least divides honors in date and anticipated a greater range of functions than contemplated in the other. Anyway both have expired now, but the difference I understand is about three million dollars (in favor of Selden).

Later in the same year the younger brother, who was engaged with a large manufacturing concern, resigned therefrom, returned home to work in conjunction with the other brother in constructing a machine of this novel type. Space was rented in what was then known as the Union Iron Works, at Newark, Ohio, and a gasoline engine was bought from the Charter Gas Engine Co., Sterling, Ill., which was decided to be the best suited for the purpose.

This engine was dismantled and reconstructed in such a way as to make it suitable for portable use. (A description with some dimensions are given later which compared to the present state of the art may seem strange.)

The congestion of freight, on account of the Chicago World's Fair, caused a most distressing and disastrous delay in the delivery of the engine, so that the original plans had to be abandoned for that year in order to get into the field at all. New plans were hastily got out contemplating using the engine as a detached unit for that season and later to return it to the shop, where the original plans could be carried out. In the haste and conservation of funds on the temporary construction, a common though serious mistake was made, namely, too much haste and economizing on cost on account of the temporary nature of the work, the wheelbase was not long enough and too much of the weight was placed on the rear wheels. This caused the engine to vibrate to such a degree that it was difficult to keep it in alignment with the thresher and it used up a large percentage of its power shaking itself, as it were, and after one day's test it was found necessary to abandon its use for that season. A sore disappointment it was to its promoters, but with the courage born of desperation, they purchased a new steam engine at once in order to carry on the season's work.



Reproduction From Patent Specification of Jones' Self-Propelled Gasoline Thresher

did not dampen the spirits of those who participated.

—The Jones brothers, Griffith and Lewis, who a year ago purchased one of those celebrated gas engines, for the purpose of doing threshing and other work heretofore done by horse and steam power, have fully demonstrated the practicability and utility of their purchase. Many farmers can attest the desirability of having their work done by this mode, for the gas engine does its work speedily and excellently. This is the first gas engine ever used in this section of the state for farm work, and the Messrs. Jones have labored dilligently and earnestly to have it succeed, and their efforts have been amply rewarded. They are deserving of liberal patronage and we feel confident that our farmers will appreciate the great good already accomplished and give them a fair share of their work.

On Friday Next, August 6a

How a Local Paper Noticed the Event

These were times when credit, courage and fidelity of friends were tried to the utmost. One practical neighbor remarked, when he saw the second new engine arrive, "Well that will break you if anything will, two new engines in one year." Many other (unrequested) opinions were expressed on the subject to the effect, "that such a motor could never produce enough power for such work," etc., etc., and all this was only some twenty years ago.

Fortunately the steam engine was disposed of the following winter.

In the spring of 1894 the enterprise was again undertaken, this time in the shops of the McNamar Machine Works, Newark, Ohio. With the acquired experience and more leisure in which to accomplish the work a very creditable machine was produced. From its test trial and on throughout the season it behaved splendidly, probably with no more "cranky" spells than the present day gasoline engine. A great many of the previous heartaches were forgotten when the end striven for was finally accomplished as related in the clipping herewith reproduced from the Granville Times, July, 1894.

The Audit Bureau of Circulations means Circulation Facts—not Unverified Claims.

Some of the dimensions were: Cylinder, 9-in. bore by 16-in. stroke, shop rated speed, 160 r.p.m. (in operation it made 200 to 225.) One flywheel, 66 in. diameter, 6-in. face. Two belt-wheels, 42-in. diameter by 6-in. face, one keyed to the shaft, the other used as an idler. The old time hot tube ignition was used, as electric ignition had not then been developed. The wheel-base was about 10 ft., 6 in.

How some of the parts entering into this pioneer were obtained may prove interesting. The timbers used for girders under the engine were small trees cut and hauled to a saw mill by the older brother and there sawed to 5 x 5 in. square, 12 ft. long. The rear wheels and axle came from under an Aultman-Taylor traction engine, and were about 5½ ft. high with tires 8 in. wide; the frame girders were "underslung" to carry the engine as low as possible to insure stability. Two truss rods were used to strengthen the girders and extended from the front end of the frame to the rear axle. The front wheels did duty at one time under a large Watertown engine, and were 3½ ft. high with 6-in. tires. The front axle pivot or fifth wheel came from an old Springfield threshing machine. The two belt-wheels were bought from the Scheidler Machine Works.

The engine shaft was not long enough to carry both wheels and had to be pieced out about 5 in. by drilling into the end of the shaft, which was 3½ in. diameter and threading in 1¼-in. capscrew through an extension piece. The jacket-cooling water circulated from a wooden box on the forward end of the frame, and the gasoline supply was stored in a round galvanized iron tank at the front also. In fact, in general outline it resembled some of the present day types to a marked degree. It met with the serious mishap of having the water-jacket burst, but after this was banded up the engine did good work for a long time. The price of gasoline, as I remember at that time, was 6 cents a gallon by the barrel, and a full week's supply would cost less than ten dollars. After performing its part in threshing grain, grinding feed, making cider and various other work, it was finally dismantled, sold and shipped to "somewhere in Kentucky" to be used for stationary work where it may still be doing good.

Ford Tractor Plant Building

The largest single building contract ever awarded on the American continent is that just awarded by Henry Ford & Son Co., of Detroit, for $20,000,000, and is for a huge plant for the manufacture of tractors on the River Rouge in Detroit. The contract for the plant has been awarded to the George A. Fuller Co., of Worcester, Mass.

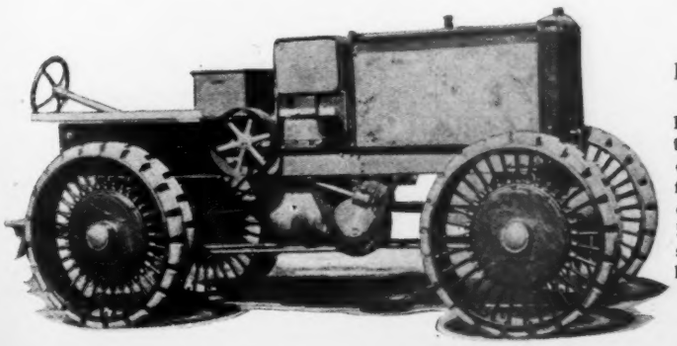
In the new plant there will be eighty-two buildings constructed. $8,000,000 will go for labor and more than a million tons of steel will go into the structures. Three shifts of workmen will be employed, each working an eight-hour day, and the completion of the project will take nearly two years. The undertaking is to be financed by Henry Ford without outside assistance.

First will be erected a battery of monster blast furnaces and then will come the tractor buildings. These buildings will be rushed to completion so that the types of army and similar tractors may be turned out. Some of these tractors are to be used in Europe for hauling huge guns.

Present plans call for the turning out of completed tractors not later than January 1, 1918. The huge blast furnaces will turn out the steel used in the building construction and will utilize five hundred skilled employees in that work. As the construction of the tractor buildings progress, the Ford machinery will be installed and long before the final touches are placed on the buildings the manufacture of the tractors will be well under way.

One set of buildings alone will occupy 134 acres. They will be known as the River Rouge department and will consist of blast furnaces with a capacity of a thousand tons per day; docks, 2400 ft. long, jutting into the river, coke ovens and similar structures. All of the steel used in the construction of the finished Ford cars of the Ford Motor Car Co. and the tractors of the Henry Ford & Son Co. will be made in these ovens.

THE LA CROSSE TRACTOR CO., La Crosse, Wis., has just gotten out an instruction book and repair price-list on the La Crosse Happy Farmer Tractor Model B. It is very clear and complete and contains many valuable suggestions. On September 8 the company shipped another carload of Happy Farmer Tractors to its New York State distributor, M. Maloney Co., Inc., Syracuse. The two plants of the company are being worked night and day to keep up with orders.



Rubber Tractor Tires

The use of 48 x 6 in. Kelly-Springfield sectional block tires as regular equipment on the 45-h.p., four-wheel, internal-gear drive tractor of the Tractor Producing Company, Lansing, Mich., is illustrated herewith.

Tractor Attachment Association Organized at Chicago

Pursuant to a call issued by president pro tem., L. H. Boydston, representatives of the following tractor attachment manufacturers—Smith Form-a-Tractor Co., Curtis Form-a-Tractor Co., Farm Tractor Co., Unitractor Co., Pullford Co., Geneva Tractor Co. and the 3-P Auto Tractor Co.—met at the Hotel LaSalle, Chicago, Ill., on October 8, 1917, and formed an organization to be known as the National Tractor Attachment Association.

J. H. Palmer, of the Farm Tractor Co., Fond du Lac, Wis., was chosen president; V. P. Wilkins, of the Unitractor Co., Chicago, vice-president, and Fred M. Loomis, secretary and treasurer.

A committee consisting of F. W. Curtis, of the Curtis Form-a-Tractor Co., Chicago; A. M. Ford, of the Geneva Tractor Co., Geneva, O., and V. P. Wilkins, of the Unitractor Co., Chicago, was instructed to prepare by-laws to be reported at the next regular meeting of the association, in November. Just what form the policy of the association will assume has not been definitely determined, but will be considered at the November meeting. The association contemplates, however, a campaign of education along tractor attachment lines to show the farmer how he can use that power he already possesses, the means being provided by the tractor attachment. It is probable that a conservative and uniform plan of publicity will be decided upon.

Tractor Lighting Generators

In connection with the operation of farm tractors the need for a reliable source of illumination at night has been forcibly brought out at the demonstrations at both Fremont and Toronto. Long hours of duty are necessary if these machines are to yield their maximum return, and users are demanding more and more that lighting outfits be furnished that will operate for long periods without adjustment or disorder.

Attention is called to the suitability of the recently developed Westinghouse lighting generator for use on tractors. This generator was especially developed to meet Government requirements for truck work, but on account of its rugged construction and adaptability to effective operation on tractors it is offered to tractor manufacturers who desire to satisfy the tractor buyer's demand for adequate lighting equipment.

On page 36 of the September issue of this Journal appeared an illustrated detailed description of this generator, which is a product of the Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.

REPUBLIC TRUCK CO., Alma, Mich., announces that its new building is nearing completion. This building will contain a blacksmith shop in addition to the motor and transmission assembling departments. The yards are being paved with concrete, new turntables are being installed and an experimental and testing room is being fitted up. The building when completed will be 240 x 112 ft.

THE COMMERCIAL CAR JOURNAL is the only truck journal a member of the Audit Bureau of Circulations—"There's a reason."

Farm Tractors Becoming Indispensable

TRACTORS are now being used in practically every agricultural district of the country. Farmers have been purchasing these machines in large numbers during the past year. The success attending the use of the pioneer machines induced others to avail themselves of this form of power on the farm.

The experience of farmers last fall has convinced them that this new force on the farm has peculiar advantages. The accumulated experience that farmers are getting in handling these machines, first in securing the greatest efficiency from the engine and second, the different kinds of work upon the farm for which these tractors may be employed and also the improvements that manufacturers are making, are doing much to popularize the tractor in the rural districts.

The tractor, like the automobile, is having a better chance today than it did two or three years ago, because there are more experienced operators to handle them. Tractor men unqualified to run these machines were responsible for some of the failures to get good service from them. But the situation is much improved. Farmers and farmers' boys are rehearsing the different features of the different makes of tractors, the best methods of operation, the ability of the different machines to accomplish his work quite as naturally as they formerly did with their favored team of horses. While this interchange of experience is already familiarizing the farmer with tractor requirements, it is going to mean more in the future, for it is going to develop a large field of operators so that farmers will not be handicapped with a lack of good tractor engineers. As a matter of fact, it is no more difficult to run the ordinary light farm tractor than it is to run an automobile.

Horse Offers No Comparison

Experience has also shown that there is no comparison between horses and the tractor where it is found that conditions are such that the tractor can be operated profitably. Of course, there are some conditions where a tractor should not be used, and no reputable dealer will place one in operation under such conditions, not only for the protection of the purchaser, but for his own reputation for integrity.

As an example of the practicability and profit to the farmer of the small tractor, the experience of some farmers in this State last summer may prove interesting.

The cost of the tractor is $775, delivered here, and on several occasions, pulling two 14-in. plows, this tractor has plowed a full acre per hour. In a number of other instances the average was ¾ acre per hour. Near North Yakima a tractor put up 85 tons of ensilage in 13 hrs., burning distillate, at a cost of $5.06. Previously the owner had taken two days to put up the same amount of ensilage and had to hire a team to haul coal and another to haul water.

In southern Washington and in Oregon the farm tractor is proving profitable in orchards. In eastern and western Washington its versatility for pulling trees, stumps, hauling stones from rough ground, plowing, mowing, binding hay, baling, pumping, etc., many things that horses could not possibly do, thus proving that it is really a mortgage lifter.

The introduction of the farm tractor will not, as some believe, remove horses from the field and their pastures. Some prophets, who predict that horses on the farm will soon be only a memory, will quite likely be but memories long before the horse is. The advent of street cars did not have that effect on horses, neither has the bicycle nor the automobile. Today there are more horses in this country than there were 10 years ago, and prices are considerably higher. The one thing that the farm tractor will do is to supply the needed power on the farm that horses cannot give. Take away the farm tractors which are in use today and several hundred thousand horses would be required to replace them, for until horses could be had the land would have to go unplowed and untilled.

Necessity Demands Increase

The number of tractors now in use will be multiplied many times during the next 10 years, but there will still be as many horses in this country as there are today and prices will be even higher than now.

Farm tractors are becoming a necessity just as electric cars have become. No one will agree that there are not more miles of telegraph in use today than there were 10 years ago, nor can it be said that there are fewer messenger boys, yet the telephone is in almost every business house and many households, doing their work faithfully, and for which there was but little demand years ago.

The farm tractor will simply fit into the greater needs of the country and will do the heavier chores and drudgery that horses are little fit for. It will not replace the horses but simply assist them and make life easier for them. It will also enable farmers to breed better horses because their brood mares will be kept for that purpose and not have to do the heaviest kind of work. Let us not dream too long on the practicability of the horseless farm; it is a long way off as yet.

The suiting of the particular tractor to the individual conditions under which it must operate is a problem as big for the salesman and distributor as that of the farmer. Now that the tractor is an acknowledged factor in every line of farm business, and is here to stay, the requirements of the distributor and the salesman go far beyond elucidating on the particular points of construction of the line that they are selling. The successful dealer of the present day must have the ability to solve the problems of transportation presented in each individual case and to sell the prospective buyer proper equipment to give the maximum efficiency under the conditions covering each particular case.

With few exceptions no tractor should be put in operation upon the farms of eastern Washington unless the vendor has gone personally over the ground and seen the conditions under which it must operate. In that way only will the purchaser be absolutely sure that he is getting the best possible advice under the circumstances.

Another item of equal, if not greater importance than that of having the dealer go over the ground personally, is to make sure before the goods are purchased that the distributor has ample stability for protecting the purchaser in case of breaking of parts. Regardless of the cause of breakage, unless the parts are within easy reach, all the time which the machines may save may be wasted in waiting for parts to come from the factory.

No distributor is justified in placing a machine in operation unless he is prepared to adequately protect it. What good is a tractor in the middle of the field laid up for two weeks waiting for parts to come from the factory?

Just as horsepower in the past has supplanted the man with the hoe, so in the future the tractor will supplant the horse in many lines of work. It took man many ages to realize that by using horse-drawn machines he could greatly increase his efficiency. Today, few men realize that the tractor has taken the place of the horse for all manner of farm work. It is replacing the horse for the same reason that the horse replaced the ox team—it is more efficient.

Enters Farm Tractor Field

C. F. Redden, president and founder of the Redden Motor Truck Co., has sold out his entire holdings and interests in the company bearing his name and has resigned from the presidency of that organization in order to devote his entire time and attention to the development of a sales organization which will market a popular priced farm tractor.

MONARCH TRACTOR CO. has been incorporated recently in Canada, with W. M. Smith as president. The company is planning to erect a factory in Toronto, the output of which is to be devoted to foreign trade as well as to sales in the Dominion. The first 250 machines are to be built for the French government. The Monarch tractor is made in three sizes, for drawing either two, three or four plows or other implements or tools using similar power.

HOUK MFG. CO., INC., Buffalo, N. Y., has been taken over by the Wire Wheel Corp. of America.

Advertising appropriations bring greatest returns when expended in the CCJ

Novel Bullock "Creeping Grip" Tractor

THE Bullock Tractor Co., of Chicago, Ill., calls particular attention to the "Center Oscillating Track" feature of its tractor which relieves the frame of excessive strain when the tractor is working over uneven ground, thereby eliminating the danger of disalignment of gears and broken gear cases.

With the "Center Oscillating Track" each entire track, together with its truck wheels, sprockets and idler, is hung on the frame and rocks or "oscillates" on an axle, independent of the other track. Thus one track may dip down into a rut and the other encounter a hummock at the same time.

The entire weight of the tractor rests upon six truck wheels that roll over the smooth steel rails of the track. These track wheels are of close-grained white iron and chilled. All bearings of the track are fitted with oil cups to insure perfect lubrication.

The track shoe is a one-piece, solid, high-carbon casting, each track section being complete in one piece. The link, as well as the shoe, overlaps the next section, and when extended forms a rigid, smooth track over which the truck wheels roll.

The overlapping shoe and link design is self-cleaning, and as there are no openings between the shoes, the possibility of dirt falling into the track is prevented to a great degree and thus friction and wear are reduced and longer life to the track is insured.

The pins that hold these track sections together are of high-carbon, case-hardened steel, as are the bushings in which they work. Both pins and bushings are removable and can be replaced for a trifling sum.

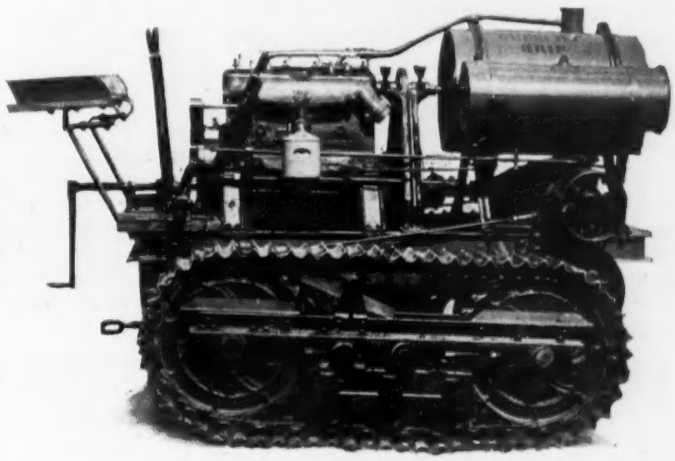
Power from the motor is transmitted through the main engine friction clutch, inside the flywheel, to the transmission which has hardened steel gears and a hardened steel sliding clutch jaw for the reverse. The belt pulley is on the end of the transmission or first cross shaft, and stops and starts with the main engine clutch. Two friction clutches on either side of the transmission and below it operate independent of each other and are controlled by two levers at the operator's seat. With these levers the machine is steered, and by holding the power on one track and releasing the other the machine can be turned completely in its own length. These clutches are very sensitive and make the tractor as simple and easy to operate as the reins of a team.

On the shaft of each clutch is a sprocket; two roller chains connect these with sprockets on a pinion shaft and these pinions in turn drive the large sprocket wheels at the rear. The front wheels are of the same size but are only idlers.

This construction is extremely simple and elastic and on account of its flexibility, eliminates the danger of stripping the gears when the tractor, while pulling its load in plowing, encounters an obstruction such as a root or stone. This tractor is further provided for such an emergency by a spring draw-bar which takes the jar and shock of the load.

The sprockets and idlers are held in place by powerful angle beams, the boxes and bearings are of exceptional size—thus a perfect alignment of the sprockets, truck wheels and idler is assured.

The engine is 4½ x 6¼-in. Waukesha, special heavy-duty tractor type. Ignition is by Dixie high tension magneto, with impulse starter. The carburetor is a Bennett, 1¼-in. adjustable for kerosene, gasoline, distillate or alcohol. The intake air is cleaned by a Bennett air cleaner. The speed of the engine is regulated by a fly-ball type governor running in oil. The belt pulley is 12 in. diameter, 8 in. face and runs at 575 r.p.m. The plowing speed recommended is 2¼ m.p.h. The dimensions over all are: Length 9 ft., width 6 ft. 9 in., height 6 ft. 4 in. The ground clearance on hard ground is 15 in.



The Bullock "Creeping Grip" 20-12 Tractor

A feature of its construction is the "center oscillating track," which permits each track to rock or oscillate on an axle, each track being independent of the other.

Bullock "Creeping Grip" Tractor in Action, Showing It Pulling Two Binding Machines

The tractor can make an especially sharp turn, which is very desirable for this work

Engines of the Brennan Motor Manufacturing Company, Used With Single-Caterpillar Type Tractor

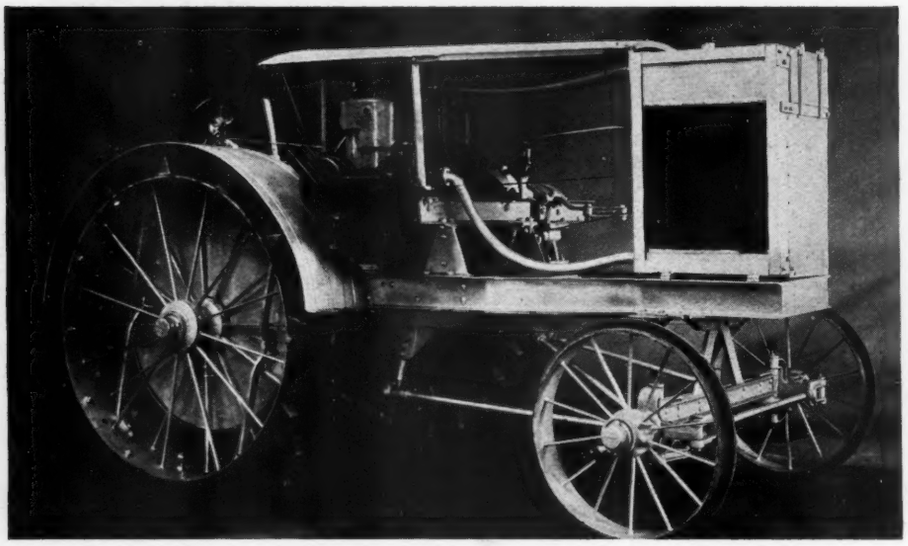
Receiving its power from a Brennan engine, this "creeping-grip" tractor is seen drawing a train of loaded trailers. The engine used is model B. It has four cylinders, a 4½-in. bore and a 5-in stroke. A Three-speed Syracuse transmission gear is used. The power is transmitted to the traction bed from the jackshaft through a roller chain and sprockets. The Brennan Motor Manufacturing Company, Syracuse, N. Y., is the maker.

Interesting and helpful information; reputable advertisements—that's the CCJ

Light "Allwork" Kerosene Tractor

THE outstanding feature of the "Allwork" tractor, built by the Electric Wheel Co., of Quincy, Ill., is its lightness in weight and the fact that it has the largest four-cylinder engine used in any three plow tractor. The 5 x 6-in. engine assures a surplus of power, which is very important, as the average operator has a tendency to overload his machine. Another feature is the direct transmission of power by means of a spur gear drive to a roller-bearing rear axle through the drawbar. The weight of the machine is only 4800 lb.

Every heavy working part and gear on the Allwork tractor is thoroughly encased and is provided with some means of constant lubrication. The transmission and differential run in a bath of oil, while the bull gears and pinions are provided with self-oiling devices, which can be regulated.



"Allwork" 12-25 H. P. Kerosene Tractor With Four-Cylinder, 5x6-In. Engine

Note the transverse mounting of the power plant on a subframe, permitting the power plant to be removed from the tractor without dismantling the whole machine. A large cellular radiator with a bronze centrifugal pump eliminates all tendency toward overheating. The radiator is twenty-five per cent larger than recommended for a 5x6-in. engine.

This machine will burn either kerosene or gasoline. A special equipment is provided, which consists of an attachment for carrying a constant stream of warm air to the carburetor to vaporize the kerosene, while a special combination exhaust and intake manifold is used to keep the kerosene in a gas condition until it reaches the combustion chamber. The ordinary gasoline carburetor is used and no water is used in the mixture.

The plan view shows clearly the simplicity of the construction of this tractor and the manner in which the power is transmitted direct to the driving wheel.

As to the experience of this company in the tractor field, it may be said that this company built its first tractor twelve years ago and since that time has experimented with every well known type of engine, including single cylinder, double-cylinder opposed, twin-cylinder and four-cylinder uprights. The result of their experiences has led them to adopt the four-cylinder upright engine and they lay special stress on the fact that their engine is built expressly for tractor work, being made amply heavy in all parts and built of the best material. This company also believes that the three-plow tractor is the one which comes nearer to covering the requirements of the average farmer than any other size. For this reason they have specialized on this size. This tractor is amply powered to pull three plows under adverse conditions and four plows under favorable conditions.

The Allwork engine is designed to run at 2700 r.p.m. and at this speed develops 28 h.p. at the belt and 14 h.p. at the draw bar. It is guaranteed to develop 25 h.p. at the belt and 12 h.p. at the draw bar. The cylinders are cast separately and are provided with large water jackets to insure perfect cooling under most severe conditions. All bearings are nickel babbitt, there being five main bearings. The inside bearings are 3⅜ in. long; the end bearings are 4⅜ in. long. The crankcase is made of cast iron, which is of ample thickness to insure rigidity. The lubrication is provided with a self-contained oiling system. An eccentric driven plunger pump takes the oil from the reservoir in the bottom of the lower crankcase and distributes it to the several bearings, to the gear case and to separate compartments under each crank, where a constant level is maintained for the splash system of lubrication.

Transmission is of the sliding gear selective type, two speeds forward and one reverse. Gears are cut from forged steel, enclosed in a dust-proof case and run in oil. No gears are in mesh with the engine when it is doing belt work. The clutch is of the friction disc type, the plates being lined with Raybestos. The control of the machine is effected by two levers, one operating the clutch and the other the speed changes. These levers, together with the steering wheel, are all within easy reach of the operator's seat. Steering wheel is of the worm and segment type, giving a quick positive action. The tractor turns in a 12-ft radius.

Other Specifications of Tractor

The frame is of channel steel construction, reinforced with steel angles in all corners and hot riveted. The rear wheels are 48 in. diameter, 12 in. face, fully equipped with pyramid lugs and 4-in. extensions. Front wheels are 32 in. diameter, with 6 in. face. Rear axle is 2 7-16 in. in diameter and made of cold rolled steel running in roller bearings. Belt pulley is 12 in. in diameter, 7 in. face. Dimensions of the tractor are 5 ft. 6 in. wide, 5 ft. 9 in. high, 10 ft. 5 in. length over all; wheelbase is 6 ft. 8 in.

This company lays special stress on the manner in which it encloses the driving gear and the lubrication of it. There is an oil cup attached to the oil supply tube, which keeps the bull pinion and bull gear properly oiled. This oiler is on the inside of the wheel guard within sight and easy reach of the operator. When he starts the machine on traction work he simply opens the regulator and oil to the proper amount is fed automatically and regularly to the pinion and gear. An especially well made guard over the rear wheel is one of the tractor's refinements which adds greatly to the comfort of the operator. This wheel guard prevents dirt from being carried up by the drive wheels, insuring to the operator freedom from dust however windy the day.

As opinions are about evenly divided as to whether it is more advisable to run the tractor in the furrow or on the land, this company has designed a front axle attachment or extension, which can be very easily and quickly attached with the aid of an ordinary jack and wrench, and permits the tractor to be run on land.

California Has Tractor Show

Twenty-five dealers in tractors and motor driven farm equipment have united to form the Traction Engine and Implement Dealers' Association of Southern California, with headquarters in Los Angeles. Through the co-operation made possible by this organization, intensive work will be done to interest the ranch owners of this section in the possibilities of gasoline power. A field exhibit and five-day demonstration was held on Telegraph Road, September 18 to 22. The exhibition and demonstration of motor trucks, as well as tractors and implements, was allowed.

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

Relation of the Tractor to Agriculture*

By HARRY H. BATES

I SAW an advertisement a short time ago designed by Mr. Bartholomew in which a monument of the total of all industries was shown, erected on a broad base named "Agriculture." This base had built onto it the different sections of the structure, such as Mining, Manufacturing, Railroad, Banking, etc. Under this base, coming out through a hole in the side of it, looking for all the world as though it were responsible for the base itself, crawled a little tractor. I don't remember whether the tractor was an Avery or a Steel Mule, but no matter, the thought was there just the same.

This picture represented the idea that Agriculture was the basis of all industries and that the farm tractor was not merely associated with it, but was the thing which would form the very back-bone of all Agricultural endeavors. This being true, the tractor industry is destined to be one of the foundation industries of the country.

With the American farmer, agriculture and power machinery are absolutely inseparable. In the early days of our country, a farmer had the opportunity of working as much land as he was physically able to and almost every foot of it would produce crops by merely scratching it.

Territory Available Unrestricted

Living in a vast country, unhampered by nature, or a foreign people other than the Indian, ever since he arrived from Europe the American farmer has had all the land he could work, almost without restriction.

This means that there has in the past been more available land than labor to work it, so that made a condition such that if a man did take land to work, he must figure on working it himself without the assistance of much outside help.

This didn't bother the American farmer at all, however. He cleared his land, plowed his prairies, and raised his crops and didn't ask any help of anybody. If he wanted land he went out and took it—when he wanted power he went out on the prairie and caught it, and when he needed more human help he schemed around and made something which with the addition of horses would multiply his own efforts.

Everything was free if he would work it, but he absolutely had to depend on his own ingenuity because he, on account of the lack of labor, was forced to play the game alone.

Thus came into existence farm machinery as we know it today, a something which was a substitute for labor that could not be had and which would multiply the farmer's own labor many times.

Just because necessity drove him to it, the American farmer created farm machinery and did it himself too, as the Patent records show; in fact, in a big number of cases he started up the factory to make them.

Did you ever stop to think that practically all the farm labor machinery used in the world originated in America, and that while we ship our implements all over the world, we do not import any of them?

In Europe the conditions have been far different—comparatively small countries inhabited by a large number of people did not allow the European farmer unrestricted land like our farmers had here. Early in the history free land gave out and people had to crowd in closely together so everybody could live. Also because of the large number of people in a confined area, there could not be spared additional land for feeding horses. This brought about a condition which made the area of land a man could cultivate be that which he would work with his own hands.

Just previous to the present war the spade and the hoe were the most used productive implements in the European agriculture, and it was no uncommon sight to see 25, 50 and maybe 125 men, women and children in one field, cultivating the ground by hand. This hand work without the aid of horse power set the European farmer to thinking in a different direction than the American farmer.

Instead of thinking how to make machinery and allow his own efforts with the aid of horse power to cultivate more acres to get a bigger crop, the European farmer kept thinking what could he do to the ground with his hands to produce a bigger and better crop, so he added chemicals and cultivated it intensively.

The European farmer, thinking in terms of chemistry and hand labor, has been able to get the biggest crops per acre of any farmer in the world, while the American farmer, thinking in terms of machinery and power, has become able to handle the biggest number of acres of any farmer in the world.

European Farm Territory Small

From the standpoint of living conditions the American farmer has been the more fortunate, because where the European farmer is dependent only upon his hands and his chemicals, works his head off, and barely makes a living, the American farmer with his broad acres, his machinery and using the chemicals nature put in the soil herself, has become the most comfortable and independent farmer.

Expanding population with its ever-increasing demand for more food is the farmer's task master and a relentless one. Forcing the European farmer to dig deeper and cultivate oftener, it has also forced the American farmer to constantly reach out for more land and invent more efficient machinery to work it.

All this evolution has taken place gradually. Each year the demand for food has caused more and more land to be taken up in America, more and more efficient machinery to be devised, until today the American farmer is confronted with one of the boundaries the European farmer reached long ago—that is, the free land is all gone and he is forced to dig deeper.

Now the American farmer has always been used to machinery and horses to pull it with—machinery to multiply his own efforts and horses for power.

Gradually, as his machinery has increased its capacity, the number of horses necessary to give him the power has increased also, until today, for many of its operations, it takes more horses to pull these implements properly than one man can easily handle.

So here the American farmer has reached past another boundary; not only is there no more cheap land to break up—but he has reached the ultimate capacity of farm machinery if horses had to be the unit of power.

Power Farming Now Necessary

Farming to a great extent is a question of power. The more horse power spent cultivating and tilling the land, the more the land will produce. The man who goes out and plows his ground about four inches deep, harrows it once over and puts in his seed bed will not begin to get the crop that another man does who plows his land deeply at the proper time, carefully discs and double discs it and drags it and does everything possible to make a good seed bed before planting the seed. Making this seed bed consumes power, and not only does it consume power, but it consumes time and, therefore, the amount of increase that a farmer can get, in the way of production, directly depends on the amount of power he has available as well as the amount of time he can spare for each operation.

An increased crop must come because the population is constantly increasing and everyone that comes must be fed. With no more free land to get the nutriment off the top, it is necessary to dig deeper and work more thoroughly the ground we already have.

Analyzing some of the operations the farmers of the middle West have to do to produce a crop, his need for greater power than is available with horses becomes quickly apparent.

Now for instance, to plow the land in August, when it is hot and the ground is hard, exhausts animal power much faster per acre than plowing in the Fall when the air is cool.

But plowing at this time makes more crops per acre as the Government reports clearly show, and more crops are necessary, so inevitably it must be that the plowing will be done at that time.

But horses cannot be used economically for this work at this time of the year.

*Paper read at the National Implement Vehicle Association Convention, October 17 to 19.

Everybody who is anybody in the truck industry reads the CCJ

Take for instance some results taken from the Kansas State Experimental Station during 1913 on preparing ground for wheat. Land plowed 7 in. deep in August and worked thereafter to sufficiently kill weeds and maintain a soil which yielded 32¾ bushels per acre, where land plowed 3 inches deep in September, a common practice among farmers, only yielded 16 2-3 bushels per acre.

Assuming a five horse unit was used for the September plowing, because that seems to be about the limit the average man can handle, it would have required an eight or nine horse unit to do the work as it should have been done in August, and if every wheat farmer in the United States had put that amount of effective horse power on his land last August, we would have 600,000,000 more bushels of wheat next year—wheat enough to feed ourselves and enough left over to give the allies so much "pep" they'd knock the Kaiser's eye out in 60 days.

Horse Power is Now Insufficient

But horses cannot do it. When a farmer sees his brood mares tugging their life out trying to pull the plow deep in the hard ground under the burning sun, he does one of two things—he either lifts the plows up until he is merely scratching the ground or he waits until the plowing is easier. In either case the lack of sufficient power prevents the necessary increased crop, and as an increased crop is a necessity, we must have a more concentrated and stronger power than horses can give—i. e., the Farm Tractor.

The necessity for more concentrated horse power is not only vital in the Summer and Fall, but likewise in the Spring.

With horses used for power in the Spring, it is necessity to get at the work early in the season when the ground is still wet from the Winter's frost, in order to have time to supply sufficient power to the ground and do sufficient tilling before the growing season starts.

Now if a man is to put in a crop of 40 to 100 acres of oats, he has about three days of good weather to work in and get the job done as he should.

The weather is unsettled in the Spring and not more than three or four days at a time can be counted on for continuous work. When the ground is double disked and dragged with horses, it takes considerably more power and time to prepare the ground than it does to plant the seed, so invariably rains come in between ground preparation and the seeding, making a resultant crop loss of from 10 to 20 bushels per acre over what could be obtained if the work were done properly.

More Concentrated Power Necessary

To double disc and drag at one time enough ground to keep ahead of the seeding operation, takes more horse power than the farmer can conveniently apply with horses, so a need is again apparent for more concentrated power than horses, i. e., the Farm Tractor.

Again with the corn crop, starting in to plow when the ground is wet and the weeds still in the seed, as is necessary when horses are used, the weeds start growing after plowing is done, thus causing a great amount of labor to be used needlessly during the following cultivating season, but if the horse power could be used in some other form so that a farmer can wait until the ground is in proper condition and the weeds have grown, and at that point rush in and do the job up quickly and plow the weeds under and kill them, a great deal of extra work is saved for useful jobs during the cultivating season, which in turn results in an increased crop.

Tractors Will Feed the World

This is the reason that a mechanical unit of power, greater and more concentrated than the horse, has been evolved and used; namely, the Farm Tractor. The ever-pressing demand of our rapidly increasing population for more food from the same ground has required more horse power to do this intensive work and the tractor has arrived not because it is a convenience, but because it is an economic necessity.

So pressing is the need for this increased crop and more concentrated power to get it with, that in a comparatively few years the farmer who farms exclusively with horses will cease to be among the representative farmers. The economic pressure that is brought to bear on him for more food is just as irresistible as was the demand for more labor output, per individual, to the manufacturer during the present generation. This caused the manufacturer to substitute power machinery for hand work and is causing the farmer to use power machinery for horse work.

The farmer must feed the people and as that calls for power in bigger bundles than horses can give him he, being a machinery thinking man, is adopting the tractor to his work.

Demand Bringing Change Quickly

Not only is he adopting the tractor but also tractor drawn implements so made that they take full advantage of the concentrated power.

The present European war is bringing about this transformation with a tremendous rapidity. The pressure of the European demand added to our own is calling for power machinery in farming like the battle front is calling for bullets.

Already the people of Europe, who a short time ago were hand farmers, are taking American tractors and tractor-drawn implements by the thousands, asking for all the American manufacturers can make in order to keep from having a famine.

Next Spring there will be in this country a demand for more power machinery than ever has been known before. There will be 20 farmers asking for every tractor, every tractor plow, every tractor disc and every tractor tool for each one that will be available at that time.

From the seed this war is planting the whole world is starting to put its agriculture on a power machinery basis, and this evolution is coming at a speed hitherto unparalleled by any other previous industrial change.

Ten years from today the farmer will be looked upon very much as a manufacturer, his power unit will form the basis of his operations and his tilling tools will be designed for the tractor and the tractor's power.

The relation of the tractor to agriculture was brought home very forcibly to me the other day through a young farmer acquaintance of mine who has just turned twenty-three.

This young man after having graduated from the Illinois University made arrangements with a farmer to lease 360 acres on the basis of half the crop.

With the aid of money advanced him by his father, he bought a tractor, tractor tools, the necessary seed and four horses. He worked all summer long, but every lick he put in counted. The other day he was in to see me and told me that out of his share of the crop he paid up his entire capital investment, seed, etc., made his living and banked $2300.

The previous year the tenant who had his place farmed with horses and because he couldn't do all the work himself with what help he had, the labor conditions being such as he couldn't get more competent help to assist him, he gave it up and retired to a smaller farm.

Crop Demand Per Acre Grows Fast

Several years ago when the population did not demand as much crop per acre, the value of this land was lower and the amount of power this farmer could apply on the ground with his horses brought enough crop to satisfy the landlord and let him make a living besides.

But as the demand for food increased, the land value of this farm increased to a point where the landlord's share did not leave a living for the renter unless the crop increased, which increase could only be obtained with the application of more power.

The former tenant thinking only in terms of horses, said it couldn't be done and quit. The new tenant, thinking in terms of a bigger and more concentrated power, not only showed it could be done, but made an exceptionally good income doing it and is going to add an additional fifty acres next year.

This is only one example of thousands of similar ones that are taking place all over this country—yes, all over the world at the present time, and if this war with its intensified demand for food keeps up two years longer, this change will come at such a violent speed that it is doubtful if the entire implement industry can make tractors and tractor-drawn implements fast enough to keep up with it.

WAUKESHA MOTOR CO., Waukesha, Wis., has increased the capacity of its plant 50 per cent. in order to handle large Government contracts for engines and parts. This is the second addition made to the plant within the last six months. The new addition will be completed by December 1. The Waukesha Company has a contract for 2500 Liberty engines for the new Class B War Truck, to be delivered in six months' time.

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

Turner Tractor Working Parts Enclosed

PRACTICALLY all the working parts of the new Turner tractor run in oil and are enclosed in dust-proof cases for protection against dirt. Though the working parts are all enclosed, the tractor is designed to provide easy access to the different parts for adjustment and lubrication.

The engine develops 20 b.h.p. at its normal speed of 1000 r.p.m. The constant draw-bar pull at low speed is 2000 lb. The materials used in the construction of the Turner tractor are said to provide minimum weight and maximum durability. The rear section is underslung, and the parts are arranged to give a low center of gravity. This feature lessens the possibility of tipping or overturning on hilly or uneven ground.

The wheelbase is short, being but 80 in., which, together with the automobile-type steering knuckles and ample clearance for the front wheels, allows a small inside turning radius of 6½ ft.

It is generally conceded that side draft is the one of the greater causes for loss of power in the tractor. The maker of the Turner tractor claims to have almost entirely eliminated this undesirable feature by avoiding extreme width and in arranging the wheels so that one side runs in the furrow when plowing. This wheel arrangement also aids in steering.

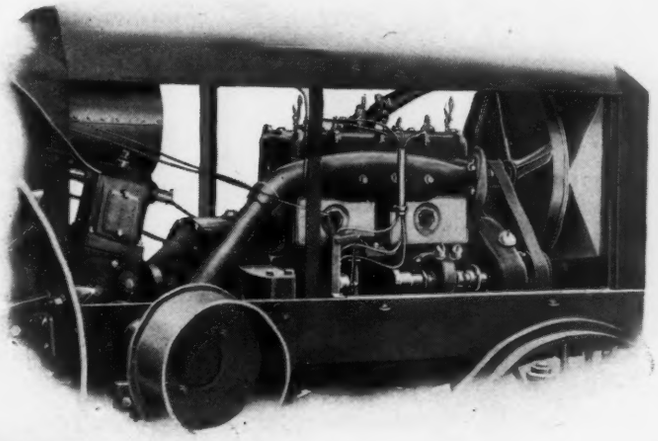
Either kerosene or gasoline can be used in the kerosene carburetor of this tractor. A convenient arrangement is provided which permits rapid changing from one fuel to the other. The 3-point suspension method is used to prevent the bearings from being pinched or binding. This flexibility is one of the features that add to the economy and effectiveness of the Turner tractor.

Specifications in Detail

The engine is a 4-cylinder, tractor-type, 3¾x5¼-in. Waukesha, with a removable head. A constant level splash lubricating system is provided. The speed is controlled by a centrifugal governor. Ignition is through a high-tension magneto with an impulse starter. An air cleaner prevents dust from entering the engine through the air suction.

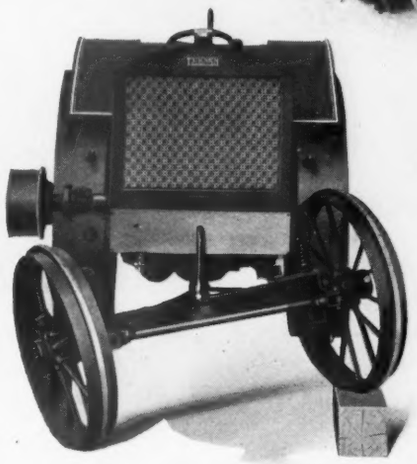
Ample cooling is provided by a large radiator, a fan, and a circulating pump. The expanding shoe-type clutch is entirely enclosed, yet is easily accessible for adjustment and lubrication. The transmission is the selective sliding gear type and is mounted on Hyatt roller bearings. The gears, running in a bath of oil, are well lubricated.

Two speeds forward, 1¾ m.p.h. in low and 2¾ m.p.h. in high, and one reverse are furnished. By varying these speeds through the throttle control, any desired speed up to 4 m.p.h. is available. Final drive is through a hardened steel roller bull pinion with a large, internal, sprocket-type, steel bull gear that is practically self-cleaning.



Side View of the Turner Power Plant

Showing how easily access to the working parts is obtained. It will also be noted that all the working parts are enclosed.



View of the Turner Tractor From the Front

The large radiator, and the flexibility and turning capacity of the front axle arrangement are clearly shown.

The capacity of the tractor is from two to three 14-in. plows. The road weight, with all tanks full, is about 4200 lb. The wheelbase is 80 in.; the tread is 48 in.; over-all length, 128 in.; over-all width, 68 in., and height, 60 in.

Other specifications include: A belt pulley, 14-in. diam. and 8 in. face, easily removable; 30x6-in. front wheels, spring mounted; 54x10-in. drum wheels, mounted on roller bearings; a 6-in. channel steel frame, reinforced; a swinging, adjustable, low-hitch draw-bar, pivoted at the rear axle; individual foot brakes; a 15-gal. kerosene tank and a 5-gal. gasoline tank; 16-gage sheet steel hood and guards, protecting all working parts.

The Turner tractor is attractively finished in light green with red running gear and is made by the Turner Mfg. Co., of Port Washington, Wis.

Simplicity in Design is an Important Feature of the Turner Tractor

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DISCO ELECTRIC STARTER CORP., Detroit, Mich., has had filed against it an involuntary petition of bankruptcy. The petitioning creditors are: the American Enameled Magnet Wire Co., Muskegon, Mich.; Eclipse Machinery Co., Elmira, N. Y., and the Standard Underground Cable Co., Pittsburgh, Pa.

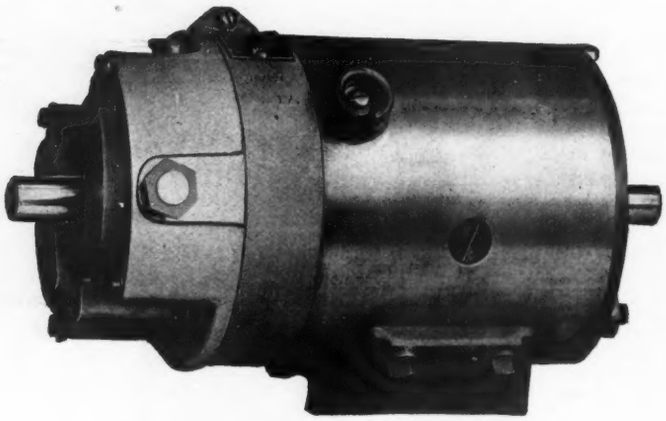
SELDEN TRUCK SALES CO., Rochester, N. Y., has recently appointed two new division sales managers, Chas. H. Gresslee and N. L. LeBlond. Mr. Gresslee will establish his headquarters at Cincinnati, covering southern Ohio, Indiana, Kentucky and West Virginia, while Mr. LeBlond will cover Missouri, Kansas, Nebraska and part of Iowa, making Kansas City, Mo., his headquarters.

Opportunity comes to the well-informed. Read the CCJ

Westinghouse

STARTING, LIGHTING & IGNITION EQUIPMENT

For the Tractor
A Foolproof Generator



WESTINGHOUSE ELECTRIC

United States Government "Standard Specifications for Class 'A' and Class 'B' Gasoline Motor Trucks," of May, 1917, state in part as follows:

"***Generators:*** The generator shall be of the *fully enclosed*, direct-current, constant-voltage, type, with a *flat or drooping voltage characteristic*, and must have a continuous capacity of 12 amperes. The voltage of the generator when installed on the truck shall be not more than 8 volts at one ampere, and not less than 7 volts at 15 amperes. The voltage regulation must be the same with varying engine speeds, up to governed engine speed.

"***Regulation:*** All voltage and current-regulating devices shall be contained in assembly with the generator. The use of sliding contact devices for current or voltage regulation, and the use of permanent magnets in the construction of generator is also prohibited.

"***Charging Speed:*** The generator shall begin to charge the battery at an engine speed of not more than 500 R.P.M. and at the same time furnish the current necessary for ignition."

These specifications require a generator with very close voltage regulation, and one that will regulate properly even if the battery is disconnected.

The Westinghouse generator for motor trucks has been specially designed to meet these strict specifications. It not only meets them but in some features goes beyond what is actually required.

Westinghouse Electric & Mfg. Co., AUTOMOBILE EQUIPMENT DEPARTMENT
Shadyside Works: East Liberty P. O. Station, Pittsburgh, Pa.

When Writing, Please Say—"Saw Your Ad. in the CCJ"

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"NORMA"
BALL BEARINGS
(Patented)

The "best" car—the "best" truck—the "best" engine—they may all be condemned, may be rendered useless, by ignition or lighting apparatus which fails to measure up to their standards of quality. A good car, a good truck, must be consistently good—good in every minute detail, serviceable in every feature which makes for serviceability.

The standardization of all high-grade magnetos and lighting generators on "NORMA" Ball Bearings is an example of engineering consistency. The makers of these accessories, seeking maximum serviceability in their product, have availed themselves of the proved "NORMA" serviceability.

Be *Sure*—See That Your Electrical Accessories Are "NORMA" Equipped

THE NORMA COMPANY OF AMERICA
1790 BROADWAY NEW YORK
Ball, Roller, Thrust and Combination Bearings.

Transportation

Freight—Express—Motor Trucks

OF WHAT use are a million Americans in France if their food, clothing and supplies are stalled in the railroad terminals throughout the United States? They must be transported to the seaboard.

Transporting goods to feed, clothe and equip our nation, its navy, its armies and our allies, is the most colossal task we have ever faced.

Every transportation unit must be used to the limit—the motor truck has become as necessary as the railroad.

Use your motor trucks for city to city hauling; to bring produce from the farms to the towns; to deliver merchandise to the door of the user; to speed up the loading and unloading of railroad cars and ships —to facilitate every phase of transportation.

The whole world is relying on motor trucks to do efficient and speedy work.

But the truck itself cannot do it alone.

OFFICERS, EXECUTIVES, MANAGERS—the responsibility is yours. It is your patriotic duty to see to it personally that your delivery system is adequately equipped and efficiently supervised.

THE AUTOCAR COMPANY, Ardmore, Penna.

"THE AUTOCAR MOTOR TRUCK"

BOSTON PROVIDENCE NEW YORK NEWARK PHILADELPHIA BALTIMORE
WASHINGTON PITTSBURGH CHICAGO SAN FRANCISCO LOS ANGELES SAN DIEGO